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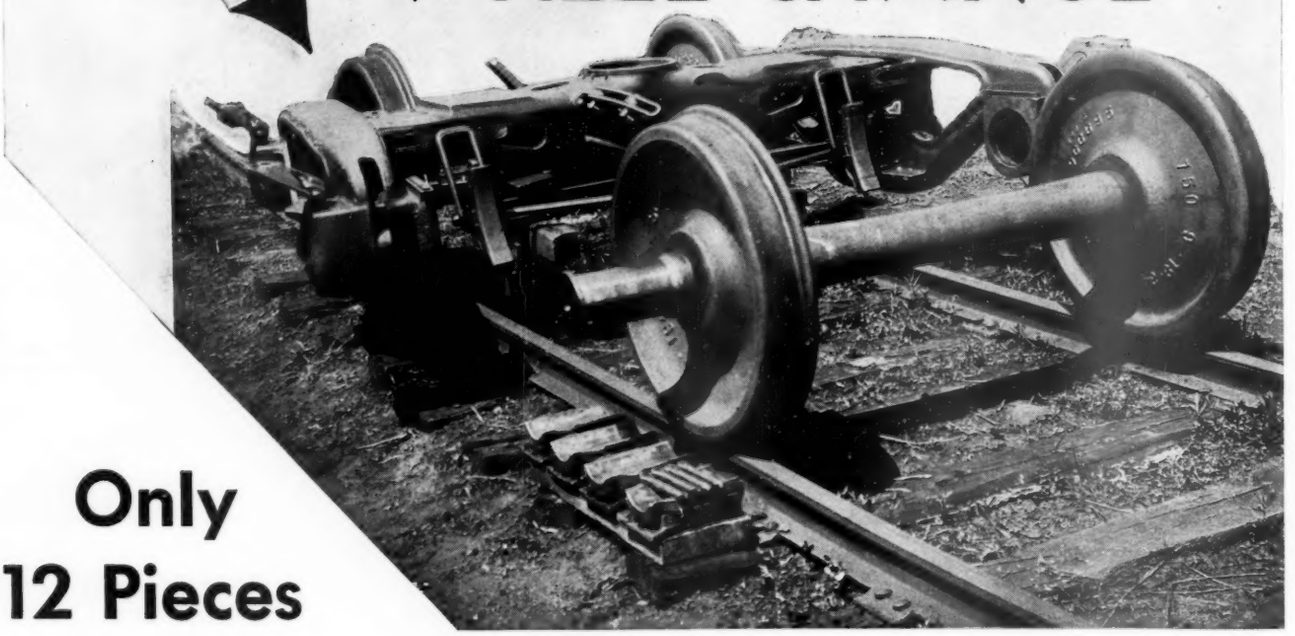

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Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

Published every Saturday by the Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa., with editorial and executive offices: 30 Church Street, New York, N. Y., and 105 West Adams Street, Chicago, Ill.

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The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.).

Subscriptions, including 52 regular weekly issues, and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free. United States, U. S. possessions and Canada: 1 year, $6.00; 2 years, $10.00; foreign countries, not including daily editions: 1 year, $8.00; 2 years, $14.00.

Single copies, 25 cents each.

H. E. McCandless, Circulation Manager, 30 Church St., New York, N. Y.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name registered U. S. Patent Office.

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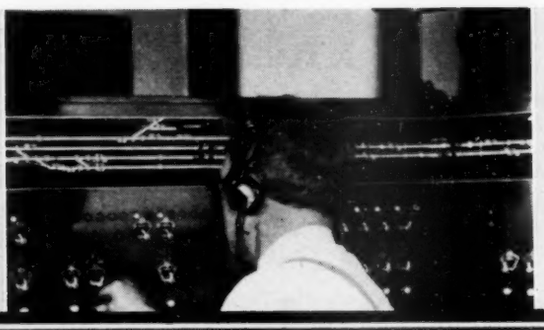

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RAILWAY AGE

Has the Commission Justified Its Existence?

Among the many addresses delivered in Washington recently in honor of the fiftieth anniversary of the Interstate Commerce Commission, several—notably among them, those of Luther M. Walter and Senator Wheeler—went directly to the point of the social necessity for an institution of the character of the Commission in our modern industrial life. Hardly anyone nowadays would question the need for the exercise by some governmental, or at least quasi-governmental, agency of some of the powers now entrusted to the Interstate Commerce Commission. Indeed, there is little dissent among intelligent and disinterested students from the proposition that Commission powers be extended over a wider area of transport than they now cover; and that similar agencies be given some similar powers over branches of large-scale enterprise other than transportation.

Commission or Cabinet?

But there is a serious question—which has only recently been raised—as to whether this regulatory power should be exercised by a quasi-judicial body such as the I.C.C. or should be surrendered, at least in part, to the Executive branch of the government. It was on this aspect of the social justification of the independent commission that Mr. Walter and Senator Wheeler based their addresses. The trend of Mr. Walter's observations was briefly reported in the *Railway Age* of April 3, page 601, and Senator Wheeler's address was published in the *Railway Age* of April 10, page 631.

The point at issue is whether decisions, which are partly legislative and partly judicial in character (and administrative only to the point of giving effect to such decisions), should be handed down by a quasi-judicial body governed only by broad principles as laid down by Congress; or whether, instead, such decisions—in large part at least—should be transferred to the Executive branch of the government; whether, in fact, these decisions should represent the rule of law, or the rule of a single individual. That is the issue at stake in the proposed governmental reorganization, which would largely subordinate the independent commissions to the various Administrative departments to which they would be assigned.

It is impossible to examine this question objectively without achieving at least some degree of approval of the goal which the President is seeking to reach. The number of government agencies which have grown up, by the reason of the lack of a plan or even any consistent philosophy, is tremendous and unquestionably has resulted in costly conflict, waste motion and chaos of purpose. An apocryphal statement attributed to the President during the campaign last fall was to the effect that, if the Republicans were wise, they would attack, not the legislative record of the New Deal, but its administrative side; for therein lay its greatest vulnerability. Whether the President uttered this observation or not, nevertheless its truth can scarcely be questioned; and the reorganization plan, whatever its defects may be, is at least an attempt to remedy an evil the noxious existence of which is evident to all observers.

But the welfare of society is a much larger and more important concept than efficiency and consistency in the Administrative branch of the government. The policy-making personnel of the latter is subject to change every four years—but people put their money and their lives into railroading and shipping and interstate commerce to stay there for their natural lives. Are the rules and principles which the experience of the years has evolved, ever drawing nearer to perfection in their efficacy in resolving conflict in these modern industrial relationships—are such rules and principles, so painfully built up, to be ruthlessly discarded every time a new Administration comes into power? If so, then we will pay for governmental harmony and smoothness by chaos in our larger and more vital relationships. That, it seems to us, is the warning intrinsic in the addresses of Mr. Walter and Senator Wheeler.

Preserving Our Heritage of Law

Reorganize the government to secure greater economy and consistency, by all means; but do the job with care, realizing the possibility that some of the time-tried governmental institutions may be developing along sounder lines than some of the recent mushroom growths from which (we suspect) most of the inefficiency and disharmony has arisen. Defense of the Interstate Commerce Commission, in those of its aspects where it shows itself as a natural and logical application of our Anglo-Saxon heritage of freedom and law, applied to modern conditions, is thus no stumbling block to Administrative reorganization; but may indeed help to direct such reorganization into channels of sound progress.

The Commission is, of course, no body of supermen.

It has, in our opinion, on many occasions gratuitously invaded the proper field of railway management. At times it has given the appearance at least of truckling to popular clamor. Usually it has seemed to us to be so overly fearful of Congress, that it has outdone that body itself in seeking to give effect to its prejudices. But when all this has been said, the whole story has not been told by any means, and cannot be until the alternatives are considered. As Henry W. Bikle and Elmer A. Smith, both of them eminent railroad lawyers, pointed out in their addresses, conditions of serious conflict existed when the Commission was created, and it has gone a long way toward solving them. The regular courts had failed to meet the new conditions which arose with the development of large-scale transport. A specialized tribunal which could act with greater expertness as to facts than a court of general jurisdiction, but which at the same time would preserve all the essential safeguards of the English and American legal tradition, was what was needed. To a remarkable degree the Interstate Commerce Commission has fulfilled this requirement—giving a continuous rule of law in place of chaos on the one hand, or dictatorial rule by transient administrative bureaucracy on the other.

As a matter of fact, in any conflict of merit between the Commission and the Administrative departments there is strong evidence favoring the opinion that the latter could, with more profit to the public service, go to school to the former, rather than vice versa. There has recently been published by the British government a remarkable report on the exercise of judicial and legislative functions by Administrative departments* and various independent governmental agencies. Members of this committee, which included several eminent persons, among them the well-known "liberal" political scientist and philosopher, Harold J. Laski, made a thorough examination into the extent to which legislative and judicial powers formerly exercised by Parliament and the courts had been entrusted to Administrative officers or tribunals. While recognizing the practical necessity for this development, the committee found that such delegation of power had not been uniform or consistent and was not in all cases surrounded by safeguards necessary to prevent abuses. After thorough study the committee proceeded to formulate principles of judicial conduct "to which all tribunals and persons who have to give judicial or quasi-judicial decisions ought to conform," in substance as follows:

This Safeguard Is Essential

1. A man may not be a judge in his own case. "We think it is clear," the report reads, "that bias from strong and sincere conviction as to public policy may operate as a more serious disqualification than pecuniary interest . . . . We think that *in any case in which the Minister's department would naturally approach the issue to be determined with a desire that the decision should go one way rather than another, the Minister should be regarded as having an interest in the cause. Parliament would do well in such a case to provide that the Minister himself should not be the judge, but that the case should be decided by an independent tribunal.*" (italics supplied)

2. No party ought to be condemned unheard.

3. A party is entitled to know the reason for the decision.

4. When a public hearing is held, the inspector's report on the hearing should be made available to the parties at interest.

If these are acceptable principles—and we can see no reason why they should not be acceptable if even-handed justice is a legitimate goal—then it is clear that the record of the Interstate Commerce Commission is extremely good in living up to these principles, while that of some of the Administrative departments is very bad indeed. If these principles are worth anything, then it is the Administrative departments rather than the Commission which stand in need of reform.

The War Department and the Army Engineers certainly have a "strong and sincere conviction" on the question of waterway development; and yet this is the group to which is entrusted quasi-judicial decisions on the advisability of specific waterway projects. The Bureau of Public Roads has certainly been somewhat less than detached on the question of highway development; and yet, without any specific mandate from Congress to do so, the head of that Bureau constituted himself a judge of what was sound and unsound in highway finance—giving the remarkable advice that motor vehicle levies would be just if they covered the costs only of arterial rural roads, leaving all city streets and the great bulk of the country roads to be paid for out of general taxation.

Zealots May Be Entirely Honest

The British Committee in its report quite charitably added that it is "not because we entertain the slightest suspicion of the good faith or the intellectual honesty of Ministers and their advisers that we are of opinion that Parliament should be chary of imposing upon Ministers the ungrateful task of giving judicial decisions in matters in which their very zeal for the public service can scarcely fail to bias them unconsciously." And those sentiments may well be echoed about the various zealots in the Administrative departments in Washington—and in state capitals too, for that matter.

Our time is one characterized by widespread inability to see the forests for the trees. In an individual industry, one department frequently tries to gain an advantage at the expense of other departments, not realizing that the industry produces things which it can sell only when all departments co-operate. In politics—by tariffs, subsidies and other special favors—certain industrial groups strive to enrich themselves at others'

* Report of Committee on Ministers' Powers, published by H. M. Stationery Office, London, and obtainable from the British Library of Information, 270 Madison avenue, New York.

expense and in so doing unbalance the national economic machine so that nobody makes anything like as much as he would if we had a sensible economy, with special privilege entirely absent. Similarly, in government, bureaucratic specialists strive each for his own specialty, and with little thought as to the effect, whether for good or evil, on our national life as a whole.

Integration or Disintegration—Which Shall It Be?

By contrast to such evidences of disintegration, the Interstate Commerce Commission stands out almost alone among comparatively modern governmental institutions as a body entrusted with resolving into a logical whole a great mass of conflicting interests, which, left entirely to jungle law, would do incalculable harm to each other and to the national welfare. Rather than dissever the Commission, the logic of recent events and the observations of competent scholars point instead to broadening its powers to include all forms of transport; and to that we would also add, authority over the construction of waterway and important highway projects—not merely the vehicles and vessels which use these facilities. Not administrative bureaucracy replacing the Commission, but rather the triumph of the Commission idea over arbitrary bureaucracy—that is the true path toward greater consistency of government policy, the path of integration based on reasoned experience as opposed both to disintegration and to dictatorial unity.

Meantime, we hope that the Commission and its personnel may, from the scholarly discourses which celebrated its jubilee, have acquired a nobler and clearer picture of the historic role which is its to play if it can measure up to the necessary standards of courage and intelligence. Institutions which endure are usually those who understand that means are no less important than ends.

Motorists Must Observe Grade Crossing Signals

It is becoming more and more imperative that action be taken to compel drivers of highway motor vehicles to observe and obey highway-railroad grade crossing signals indicating the approach of a train. The vast majority of these drivers do observe and obey such signals, but a relatively small number either ignore them or deem it their right, when the lights are flashing, to exercise their own judgment about crossing the track before the train arrives. However, it is not alone the life of the driver that is imperiled, because his careless act also endangers the lives of passengers in his car and the lives of the crew and passengers of the train involved in the collision, as has frequently been demonstrated.

As an illustration, at 3:29 p.m., on February 15, a bright, clear day, a truck drove on the tracks of the Baltimore & Ohio at Dorsey, Md., directly in the path of a fast passenger train. The resulting collision demolished the truck, killed the driver and his helper, and derailed the locomotive and all four cars of the train, killing the engineman. In a similar instance on July 17, 1935, a westbound Pennsylvania passenger train struck the trailer of a truck on a crossing at Upper Sandusky, Ohio, derailing the locomotive and all but one of the ten cars of the train. The engineman was killed, and 27 passengers, 9 employees and the truck driver were injured. The crossings at which both of these accidents occurred are equipped with standard flashing-light crossing signals that were operating properly at the time.

These accidents, resulting from the disregard of established types of signals, are typical of similar instances which are becoming so numerous as to demand that steps be taken to correct the conditions. Through the years, the Baltimore & Ohio, in common with other railroads, has spent millions of dollars in installing and maintaining automatically-controlled signal protection at numerous grade crossings. During the last three years, several states, with the aid of federal funds, have paid for such installations at hundreds of crossings.

As of January 1, 1937, signals were in service at about 18,000 crossings in the United States. As a result of the persistent efforts of the Committee on Highway Crossing Protection of the Signal Section, A.A.R., standards have been developed for the aspects of crossing signals, and these standards have been recognized not only by the railroads but also by the United States Bureau of Public Roads, the railroad commissions of the majority of the states, the National Conference on Street and Highway Safety, and other national bodies. As a result of this co-operation, the aspect of a standard highway-railroad crossing signal is distinctive because it is decidedly different from any other sign or signal used in the direction of highway vehicles.

The requisite for the standard aspect, applying to flashing-light as well as wig-wag signals, reads as follows: "Signal used for the protection of highway traffic at railroad crossings shall present toward the highway, when indicating the approach of a train, the appearance of a horizontally swinging red light and/or disc." With thousands of these standard signals in service for years, and in consideration of the instructions issued to motorists by various states along with their licenses, any argument to the effect that the average motorist does not understand the meaning of the signals when displaying the danger aspect is unreasonable and beside the point. In the vast majority of cases in which drivers have survived accidents, they have admitted that they understood that the flashing of the lights indicated the approach of a train. Failure to obey crossing signals must, in such instances, be ascribed to sheer criminal negligence.

To solve this problem, two important steps can and

should be taken. The average driver observes and obeys stop-and-go lights at street and highway intersections. He does this primarily from force of habit, this habit having been acquired because he knows that he is likely to be arrested and fined for non-observance of such signals. However, this same idea has not as yet been impressed on his mind with reference to highway-railroad crossing signals and, therefore, he feels free to use his own judgment in obeying the signal aspect; too frequently his judgment as to the location or speed of approaching trains is in error, and an accident results. This demonstrates that the drivers of highway vehicles must be impressed more forcibly with the necessity for observing these standard aspects of crossing signals; one of the logical means of effecting such results is to establish and enforce laws making it a misdemeanor to disregard such signals.

Such regulations have been established in several cities, as for example, in Dubuque, Iowa, where signals were installed at 26 crossings in January, 1936, and an ordinance was passed making it a misdemeanor to disregard a signal when it was indicating the approach of a train. According to a recent report from the Iowa Railroad Commission, no accident attributable to failure to obey the signals occurred during the first year of operation.

During the past three years, the state of Illinois spent about $500,000 of federal money in the installation of standard A.A.R. flashing-light signals to protect 264 crossings. As a means of effecting better protection at these crossings and others similarly equipped, the state legislature amended the Motor Vehicle Act to require the driver of a vehicle to come to a stop short of a crossing wherever an automatic signal or device indicates the approach of a train, and prohibiting him from proceeding until it is safe to do so. Observation of the indication given by the signals is, therefore, obligatory in this state, the same as at a state highway, a boulevard, or a traffic signal.

An argument might be advanced to the effect that it would be impracticable to supply enough police officers to enforce observance of such a law. The answer is that the city of Dubuque is doing it, and the state of Illinois is gradually effecting better results. By policing certain crossings until violators are apprehended and then giving these cases wide publicity in the newspapers, the word soon gets around to drivers that they better obey the crossing signals. Furthermore, the broadcasting of the fact that the law requires compliance with the signals acts as a deterring influence on many drivers.

The enactment of laws by other states similar to that in effect in Illinois should be accomplished readily, not only because of the evident need but also because many states, as well as the federal government, have invested large sums in providing crossing signals in recent years. Of the 1,071 crossings at which protection was installed in the United States and Canada during 1936, federal funds paid for 639 projects, the states and provinces 48, cities and counties 15, and the railroads 369. It is, therefore, quite logical for the legislatures of the various states and provinces to take action in enacting laws which would improve the effectiveness of these signals in which they have a financial interest, as well as the obligation to enforce the greatest possible benefit in safety to highway users.

In considering the enactment of laws as explained previously, an argument might be advanced that at certain crossings the signals operate for extended periods of time when no train movement over the crossing is imminent, the operation being caused by trains standing at stations or switching on track circuits controlling the signals. It is conceded that such conditions exist at entirely too many crossings, although many of the railroads are active in providing special cutouts and controls to relieve these conditions wherever practicable. Furthermore, various roads have established and are enforcing rules that where such circumstances exist, a member of the train crew or other employee must protect the crossing so as not to delay highway traffic unnecessarily.

Decisions in Wagner Act Cases

The editorial entitled "What Are 'Commerce' and 'Regulation?'" that appeared in the *Railway Age* of April 10 was singularly prophetic. The opinions rendered by the United States Supreme Court on Monday in the cases involving constitutionality of the Wagner National Labor Relations Act vindicate in every particular the anticipations expressed by this paper as to the way in which the Court sooner or later would interpret the application of the commerce clause of the Constitution to all large companies and industries buying and selling across state lines. This is especially true of its opinion in the Jones & Laughlin case.

As anticipated by us in the editorial referred to, the federal legislation for the regulation of interstate transportation heretofore upheld by the Court has now been made a constitutional precedent for similar federal legislation regulating the business of all companies and industries buying and selling across state lines.

The Court held in substance, first, that the buying and selling of raw materials and finished products across state lines by Jones & Laughlin is interstate commerce and, therefore, constitutionally subject to regulation by Congress; that Congress has power to deal with anything that will interfere with this interstate commerce; that difficulties between Jones & Laughlin and its employees may interfere with interstate commerce; and that, therefore, Congress has power to require collective bargaining between Jones & Laughlin and its employees to prevent controversies

between them from resulting in such interference. Of course, these constitutional principles are applicable to the business of all companies and industries largely engaged in buying and selling across state lines.

Among the most significant features of the opinions in the cases involving the Wagner act is that they are replete with quotations from and references to opinions rendered in railroad cases. If decisions in cases involving issues between railways and their employees are precedents in cases involving similar issues between other industries and their employees, then it logically follows that federal legislation regulating the rates charged by railways for interstate transportation and decisions upholding it are valid precedents for similar federal legislation and decisions regarding the prices charged and paid in buying and selling across state lines. The Court said in effect that if Congress can regulate the *carriage* of interstate commerce it must follow that it can regulate the *commerce* itself; and, of course, the commerce itself, according to every definition of commerce, consists of the buying and selling.

The opinions in these cases work no revolution in transportation because transportation already is subject to every conceivable kind of federal regulation. They may work a revolution in every other kind of large-scale commerce because they open wide the way for constitutional federal regulation of all large-scale industry similar to that now applied to transportation.

The business interests that for so many years have been engaged, in their own supposed interest, in promoting increased federal regulation of railways will, no doubt, be somewhat shocked to find that by every form of such regulation they have promoted they have been establishing a constitutional precedent for federal regulation of their own business.

How Safe Is It To Travel?

The following statement appeared in an article entitled "Is It Safe to Fly?" by W. B. Courtney in the March 20, 1937, issue of *Colliers:*

"You cannot blame the air traffic man for pointing out that * * * casualties in connection with railroad operations, according to government figures, were nearly 5,000 killed and more than 16,000 injured in 1935 (of course only 18 of these dead were passengers, out of a total of nearly 500 million carried) and that you never think of these matters when you step to the window to buy a railroad ticket."

It shows a spirit of hardihood for any spokesman of the air line companies to refer to railroad accidents. It is true that in 1935 there were 5,258 persons killed as a result of railway operation. But 4,628 of these were neither railway employees nor passengers, practically all being trespassers on railway properties or persons who met fatalities at crossings of highways with railways. Only one passenger was killed in a train accident, and this fatality was not at first reported as such because due to the explosion of a heater in a passenger coach of a standing train.

The only fatalities to railway passengers comparable with fatalities to passengers on air lines are those occurring in what are classified by the Interstate Commerce Commission as "train accidents." Now let us accept Mr. Courtney's challenge and present *comparable* statistics showing the hazards to passengers incurred in traveling by air, by railway and in Pullman cars. Statistics covering a period of seven years are given herewith which show the strictly comparable risks incurred.

Scheduled American Air Line Service
(Domestic and Foreign Extensions)

	Number Passengers Carried One Mile	Passenger Fatalities	Passenger-Miles per Passenger Fatality
1930	103,747,249	24	4,323,000
1931	119,968,577	26	4,614,000
1932	146,552,587	25	5,862,000
1933	198,800,079	8	24,850,000
1934	225,267,559	21	10,727,000
1935	360,569,431	15	24,038,000
1936	491,744,053	46	10,690,000
Seven-year average	235,235,648	24	9,980,000

Source: Air Commerce Bulletin, March 15, 1937, page 194.

All Railroads

	Revenue Passenger-Miles	Passenger Fatalities†	Passenger-Miles per Passenger Fatality
1930	26,875,642,000	7	3,839,377,000
1931	21,933,345,000	4	5,483,336,000
1932	16,997,426,000	1	16,997,426,000
1933	16,368,043,000	23	711,654,000
1934	18,068,635,000	12	1,505,720,000
1935	18,509,497,000	1	18,509,497,000
1936	*22,460,893,000	‡7	3,208,699,000
Seven-year average	20,173,354,000	8	2,567,518,000

* All roads estimated from Class I figures.
† In train accidents only.
‡ Taken from monthly report. Prior figures taken from annual reports.
Source: Reports of Interstate Commerce Commission.

Pullman

	Revenue Passenger-Miles	Passenger Fatalities	Passenger-Miles per Passenger Fatality
1930	12,515,414,775	1	12,515,414,775
1931	9,891,910,222	1	9,891,910,222
1932	6,757,760,858	0	.....
1933	6,141,986,577	3	2,047,328,859
1934	6,891,002,293	2	3,445,501,147
1935	7,146,269,648	0	.....
1936	8,354,840,293	0	.....
Seven-year average	8,242,740,667	1	8,242,740,667

The figures show that 46 passengers were killed in 1936 while flying and that the average distance passengers were carried for each one killed was 10,690,000 miles. They show that in the same year the number of railway passengers killed was 8 and that the average distance passengers were carried for each one killed was 3,208,699,000 miles, or 300 times as far as passengers were carried by air for each one killed. They show that in 1936 no Pullman passenger was killed.

The seven-year averages show that on the average passengers were carried by air 9,980,000 miles for each one killed, by rail 2,567,518,000 miles for each one killed and in Pullmans 8,242,740,667 miles for each one killed. In other words, during the last seven years the safety record of the railways in carrying passengers has been 257 times as good and in Pullman cars 826 times as good as that of the air lines.

"Is it safe to fly?" Obviously not by comparison with traveling by rail and, especially, in Pullman cars.

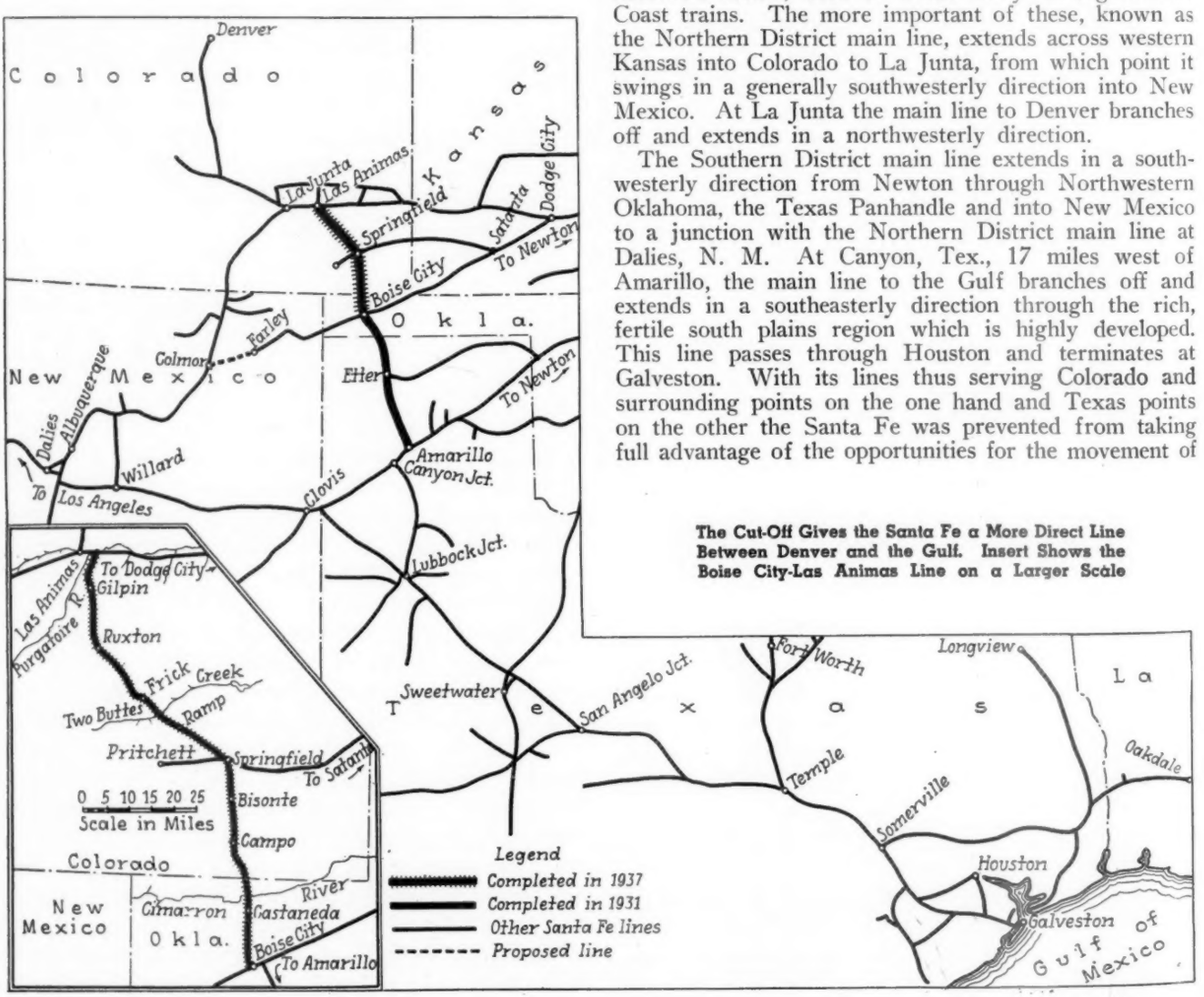
Santa Fe Completes Denver-

Recently completed 112-mile line between Boise City, Okla., and Las Animas, Colo, comprises final step in plan to provide shorter, more direct through route in Southwest

THE final step in the plan of the Atchison, Topeka & Santa Fe for providing a shorter north and south route in the Southwest was consummated on February 1 when train service was inaugurated over a 112-mile single-track line extending between Boise City in the Oklahoma Panhandle and Las Animas, Colo. Construction of this line was characterized by unusually rapid progress, the grading having commenced on May 6, 1936, and track laying completed on December 17, or 7½ months later. In fact, the maximum trackage laid in one day (16,600 ft.) during the construction of this line is considered something of a record for one track-laying organization. On the basis of the mileage involved, this is the largest single new-line construction project completed since 1931.

But probably the most important aspect of the Boise City-Las Animas line is the relationship which it bears to the Santa Fe's plan for providing a shorter route between Texas points on the one hand and points in Colorado, Western Kansas, Western Oklahoma and even the Pacific Northwest on the other. Existing lines of this company in the Southwest are readily adapted to incorporation in such a route. Between Newton, Kan., and Dalies, N. M. (see map) the Santa Fe has two main-line routes, both of which carry Chicago-Pacific Coast trains. The more important of these, known as the Northern District main line, extends across western Kansas into Colorado to La Junta, from which point it swings in a generally southwesterly direction into New Mexico. At La Junta the main line to Denver branches off and extends in a northwesterly direction.

The Southern District main line extends in a southwesterly direction from Newton through Northwestern Oklahoma, the Texas Panhandle and into New Mexico to a junction with the Northern District main line at Dalies, N. M. At Canyon, Tex., 17 miles west of Amarillo, the main line to the Gulf branches off and extends in a southeasterly direction through the rich, fertile south plains region which is highly developed. This line passes through Houston and terminates at Galveston. With its lines thus serving Colorado and surrounding points on the one hand and Texas points on the other the Santa Fe was prevented from taking full advantage of the opportunities for the movement of



The Cut-Off Gives the Santa Fe a More Direct Line Between Denver and the Gulf. Insert Shows the Boise City-Las Animas Line on a Larger Scale

Texas Cut-Off

traffic between the two districts because of the lack of a short connection between the two main lines mentioned. Traffic moving between the two areas had to be routed via Willard, N. M., which route involved a line-haul distance of 816 miles between Amarillo and Denver.

To overcome the shortcomings of this situation the railroad decided to build a line between Amarillo on the Southern District and Las Animas (19 miles east of La Junta) on the Northern District, a distance of 239 miles. This cut-off reduces the haul between Amarillo and Denver to 442 miles, a saving of 374 miles as compared with the route via Willard, and effects comparable reductions in the haul between other points in the two regions. In addition to providing a shorter route, the new line penetrates potentially rich agricultural communities that heretofore have been without railroad service.

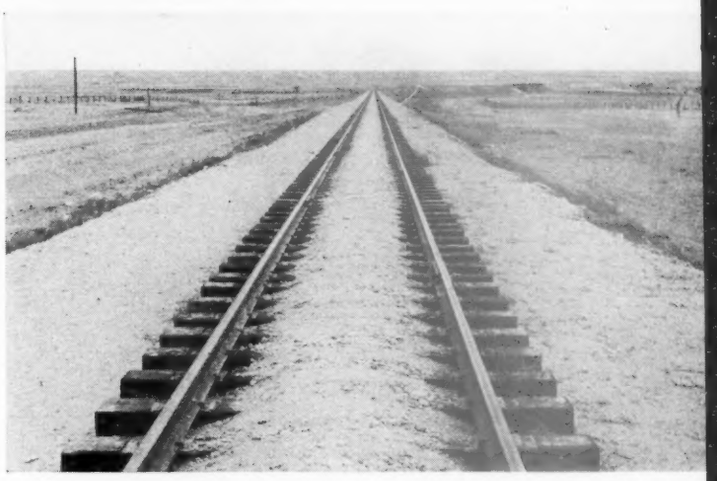
Construction of the cut-off was commenced in June, 1930, but after that portion between Amarillo and Boise City, 124 miles, had been completed in February, 1931, work on the line was suspended because of the depression, and construction of the Boise City-Las Animas portion was not undertaken until May, 1936.

Location of Line

From Boise City the line extends almost directly north 49.4 miles to Springfield, Colo., a point near the end of a branch which extends westerly from a connection with the Dodge City-Farley branch at Satanta, Kan. From Springfield the line swings in a northwesterly direction for 61.1 miles to a connection with the Northern District main line 2.4 miles east of Las Animas. By making the connection with the main line at this point instead of directly at Las Animas, the need for constructing a bridge across the Purgatoire river was avoided. The building of the line involved the construction of 110.5 miles of main track and the utilization of 1.8 miles of the existing line at Springfield. Side tracks totalling 5.6 miles in length were constructed, which include six 2,500-ft. passing tracks, four 1,000-ft. stock tracks, and a number of house and industry tracks. Throughout its length the line passes through only two existing towns at intermediate points, namely, Springfield and Campo, Colo., which are both small communities. At six other locations on the line names have been given to points where auxiliary facilities such as section headquarters, passing and other side tracks and stock yards have been provided.

Surface drainage in this region is roughly from west to east, with the result that the line crosses most water courses at right angles. Most important among the waterways crossed by the line are the Cimarron river, 15 miles north of Boise City, and Two Buttes creek, 17 miles north of Springfield. Elsewhere the water courses are mostly dry except during heavy rains when, due to rapid run-off, the flow may attain flood proportions for a short time.

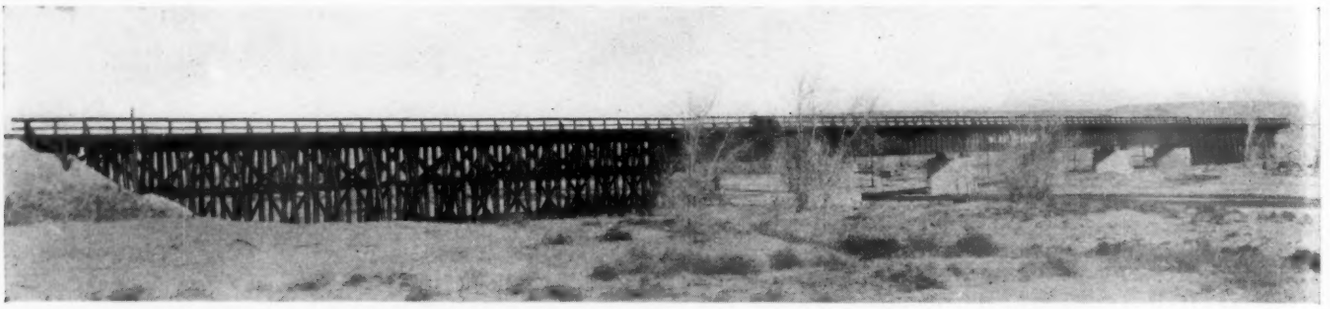
The topography of the territory traversed by the line is mostly gently rolling in character, although in places, particularly in the vicinity of the Cimarron river and Two Buttes creek, it becomes quite broken. The top



Typical Tangent Track on the Boise City-Las Animas Line. Note Character of Country.

The Pre-Fabricated Steel Bunkhouse That Was Erected for Experimental Purposes

Above—A Typical Section Headquarters Layout. Below—Track Laying Was Done at Record Speed



The Cimarron River Crossing Is the Longest Bridge on the Boise City-Las Animas Line

soil is sandy and vegetation grows sparsely, the landscape being practically devoid of trees.

Construction Features

The ruling grade of the new line in both directions is one per cent and, since the topography of the country traversed is such that principal changes in elevation are achieved at average maximum rates approximating one per cent, it was not necessary to introduce distance in the line in order to avoid exceeding the maximum grade. However, there are considerable stretches of the line where the ruling grade predominates, particularly where it descends from both directions into the Cimarron River valley and where it crosses two ridges paralleling Two Buttes creek, one on each side. The summit of the ridge north of the creek, with an elevation of 4,760 ft., is the highest point on the line and compares with elevations of 4,155 ft. at Boise City, 3,880 ft. at the Cimarron river crossing, 4,590 ft. at the Two Buttes Creek crossing and 3,870 ft. where the cut-off joins the main line east of Las Animas. Very little of the line is on a level grade.

An interesting aspect of the standards of construction embodied in the new line involves the choice of 1 deg. 30 min. as the maximum curvature, which shows the influence imposed by the increasing importance of high-speed service. When the Amarillo-Boise City portion of the Denver-Texas cut-off was constructed this influence had not exerted itself, with the result that the maximum curvature on that section of the line is somewhat greater than 1 deg. 30 min. Moreover, the Boise City-Las Animas portion of the cut-off was originally located with a maximum curvature of 4 deg. However, in the spring of 1936 when plans were being made to resume construction of the line, cognizance was taken of the increasing importance of high-speed service and of the possibility that conditions may require the inauguration of such service over the cut-off sometime in the future. Accordingly, the maximum curvature was decreased to 1 deg. 30 min. and 1,500 ft. was adopted as the minimum length of tangent track between curves. There are 45 curves on the line, or less than one for each two miles of line.

On Some Portions of the Line the Grading Was Quite Heavy

The line is laid with 90-lb. No. 1 relayer rail on treated (sawn and hewn) No. 2 prebored and adzed southern pine ties, of which 3,200 are placed per mile, and is fully tie-plated with single-shoulder tie plates. Reformed oil-quenched four-hole 100-per cent angle bars are used with new bolts and nut locks. Anti-creepers were installed on grades of 0.3 per cent or more.

The two largest bridge structures on the line are those across the Cimarron river and Two Buttes creek. The former consists of two 106-ft. and three 102-ft. deck-plate girder spans on concrete abutments and piers, with open deck pile-trestle approaches at both ends. At Two Buttes creek the structure consists of two 102-ft. and one 44-ft. deck-plate girder spans on concrete substructures, with a 252-ft. pile-trestle approach at the north end only.

There are 61 creosoted pile trestles, totalling 5,300 ft. in length, including three ballast-deck structures, which were installed on curves to permit adjustment of the super-elevation, and a number of T-rail structures. All bridge timbers were prebored before treatment. Because of the existence of an underlying stratum of blue shale in this region it was necessary in many cases to "shoot" the piling down into the shale to secure sufficient penetration. There are several reinforced concrete boxes and numerous culverts of precast reinforced concrete pipe, corrugated cast-iron pipe with concrete headwalls, and built-up creosoted wood boxes. Corrugated metal pipe drains were installed under road crossings.

Auxiliary Facilities

Auxiliary facilities constructed in connection with the line include four section headquarters, five stock-yard layouts, one small standard depot at Campo and one car-body depot, one agent's cottage also at Campo, three locomotive water stations, and telephone booths at regular intervals. Each section outfit consists of a foreman's modern frame cottage, with a septic tank and a sub-surface irrigation system for disposal of the effluent, a 12-room bunkhouse, a frame motor car and tool shed, and a deep well with a windmill and elevated steel storage tank.

A feature of the cottages is that they embody construction details designed to prevent wood-destroying termites from gaining access to the buildings. These include the provision of a continuous barrier along the top of the poured concrete foundation of each cottage, consisting of strips of 16-oz. copper, about 6 in. wider than the foundation, which are laid directly on the concrete and the edges bent downward at an angle of about 45 deg.

Collars of the same material, which flare downward, were placed on all soil pipes, and basement windows are provided with steel sash. In the motor-car sheds, measures to prevent the entrance of termites as well as to preclude decay, include the provision of creosoted pile heads as the supporting members, and the use of creosoted sills and sub-floors.

Three of the bunkhouses are of brick construction with concrete foundations and floors, while the fourth, which was purchased for experimental purposes, is of prefabricated steel construction with a frame of structural angles, carrying 1-in. Ferroclad walls and steel shingles, the floors and foundation being of concrete.

At each of the locomotive water stations the supply is pumped from a deep well by a turbine pump direct connected to a Diesel engine, the supply being discharged into a Horton steel storage tank of 100,000 gal. capacity. Coaling facilities were not required, this being an oil-burning district.

Grading

Grading on the line, which averaged about 40,000 cu. yd. per mile, involved approximately 3,000,000 cu. yd. of embankment and 1,330,000 cu. yd. of excavation in cuts, including 750,000 cu. yd. of earth, 190,000 cu. yd. of loose rock and 390,000 cu. yd. of solid rock. The largest cut, involving 170,000 cu. yd. of excavation, is located about three miles south of Two Buttes creek where the line pierces one of the ridges mentioned previously. This cut, with a maximum depth of 38 ft. is the deepest cut on the line. The highest fill, located about four miles south of the Cimarron river, is 40 ft. high. The embankments and cuts were constructed to the usual dimensions for single track lines and liberal drainage ditches were provided to prevent surface flow during rains from running into the cuts at intermediate points. In building the fills the material was placed in layers not exceeding 2 ft. in depth and a shrinkage allowance of 5 per cent was made.

The greatest part of the grading was done on the two-way, or "waste and borrow" basis, the contractors being paid for both excavation and embankment. In other words, the matter of whether excavation should be wasted or deposited in the embankment was left to the discretion of the contractor. Exceptions to this rule applied at the large cut mentioned previously where the excavated material was hauled into an embankment immediately to the north, and at a cut (99,350 cu. yd.) about seven miles south of the Cimarron river where the material was hauled into embankments between that point and the river. In both cases the free haul was substantially one mile.

Grading was commenced on May 6, 1936, and with only about 6½ months available in which to finish the work, the general contractor awarded seven grading subcontracts. Grading operations were begun on various portions of the line simultaneously, with consideration being given to the need for expediting the grading between Springfield and Two Buttes creek and between Boise City and the Cimarron river in order that these stretches of track could be laid to allow access to the bridge locations for construction purposes. However, as the grading was light for some distance out of Las Animas it was possible to complete the roadbed and lay the track for a distance of 32 miles south of that point before the grading on either of the two stretches mentioned had progressed sufficiently to allow the laying of track.

Crossties Were Hauled Ahead of the Track-Laying Train by Truck

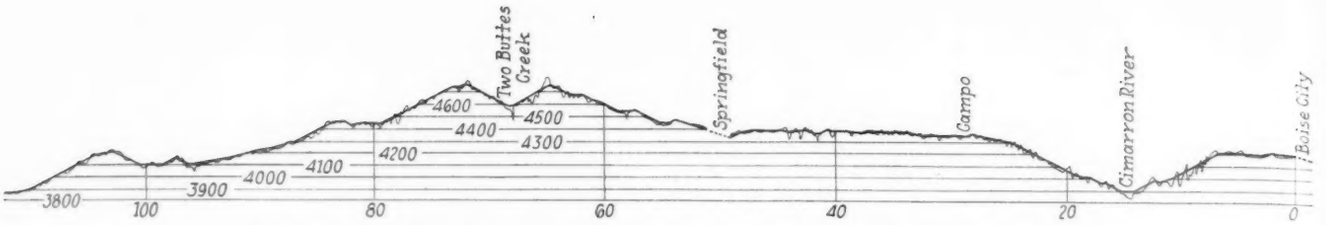
The grading operations were highly mechanized and involved the use of only a limited number of teams. Extensive use was made of elevating graders and gasoline and Diesel-powered shovels for excavating and of dump trucks of various sizes and makes for hauling the material. In some instances material was removed from the cuts with drag lines and wasted to each side. Another unit of grading equipment that was employed extensively is the 12-yd. "carryall." Many of the grading outfits worked three 8-hr. shifts daily.

Track Laying

All track was laid by one organization comprising about 175 men, not including the surfacing gang. As with the grading work, the track-laying operations were characterized by a high degree of mechanization and, further, by the rapid rate at which the work progressed, the average output per day amounting to about 12,000 ft. of track and the maximum to 16,600 ft. An average of 9 hr. daily was worked by this organization.

When starting out in the morning, the track-laying train was supplied with sufficient material, except rail, for a full day's work, additional cars of rail being brought up by a material switching train during the day and spotted on the nearest siding. Cars of ties brought out

Looking Upstream at the Two Buttes Creek Bridge



Profile of the Line Between Boise City and the Connection With the Main Line Near Las Animas

by the track-laying train in the morning were spotted at a point near the end of the track where the ties could be conveniently unloaded and transferred to trucks which carried them ahead and deposited them on the roadbed in advance of the track-laying unit.

In the rail-laying operations the rails were dragged forward onto the pioneer car (about six at a time) by means of a cable winding on the drum of a gasoline-engine powered hoist, and then barred individually over onto a gravity conveyor attached to the left side of the pioneer car and projecting about half a rail length ahead of the car. From the conveyor the rails were handled into a position on the ties with the aid of a hand-operated stiff-leg derrick mounted on the front of the pioneer car.

Until the entire train had passed over the newly-laid rails they were held in position only by bridle rods and one bolt for each pair of angle bars, no spikes being driven or tie plates inserted ahead of the train. Immediately behind the train, from which fastenings were distributed as it moved forward, the gaps between rail ends were adjusted to the proper width, using shims; bolts were inserted and the nuts run on with pneumatic wrenches, air being supplied from a portable track-mounted compressor; tie plates were inserted by jacking up the rails; the ties were spaced and straightened; four ties in each panel were spiked by hand; and the track was lined. Following behind this organization the "back-work" gang respaced the ties, inserted ties where they were lacking and completed the spiking, using six pneumatic spike drivers in connection with a portable compressor.

Surfacing

Some distance behind the track-laying organization, a surfacing gang of about 60 men brought the track to surface, using a power jack. Employing wooden mauls, two men in this organization straightened skewed ties. Where possible, surfacing material was cast into the track directly, using elevating graders or draglines. Elsewhere it was train-hauled.

Having access by rail at three points on the new line, namely, Las Animas, Springfield and Boise City, the railroad was able to shift the rail-laying organization about as appeared necessary to keep individual phases of the project, principally the construction of bridges, abreast of the operations as a whole. Moreover, by installing material yards at all three of these points, the distribution of materials to all parts of the line was simplified and delays were avoided.

With grading, bridging, building and track-laying and surfacing operations being carried on simultaneously, as many as 700 workers were engaged on this line at one time. The majority of the unskilled workers were recruited locally, thus relieving the unemployment situation and reducing the relief load in a region where the effects of the depression were deepened and prolonged by the blighting influence of severe drought.

Construction of the Boise City-Las Animas Line was carried out under the general supervision of G. W. Harris, chief engineer, A. T. & S. F. System. W. H. Rochester, construction engineer, was in direct charge of all field operations. The Sharp & Fellows Contracting Company, Los Angeles, Cal., had the general contract for all work except the setting of bridge steel which was done by company forces.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended April 3 totaled 726,687 cars, a decrease of 34,422 cars or 4.5 per cent under the preceding week, an increase of 113,106 cars or 18.4 per cent above the corresponding week in 1936 and an increase of 181,231 cars or 33.2 per cent above the corresponding week in 1935. All commodity classifications except coal, live stock and coke showed increases over the preceding week, and all commodity classifications except live stock showed increases over last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading
For Week Ended Saturday, April 3

Districts	1937	1936	1935
Eastern	166,444	140,056	129,943
Allegheny	153,954	122,824	106,439
Pocahontas	43,489	40,364	29,927
Southern	116,244	96,129	84,964
Northwestern	80,437	71,595	67,201
Central Western	107,596	90,016	82,223
Southwestern	58,523	52,597	44,759
Total Western Districts	246,556	214,208	194,183
Total All Roads	726,687	613,581	545,456
Commodities			
Grain and Grain Products	32,271	29,919	25,604
Live Stock	10,806	11,557	12,396
Coal	118,317	98,977	69,226
Coke	10,860	6,541	5,329
Forest Products	38,609	28,590	24,353
Ore	12,880	5,950	6,032
Merchandise L.C.L.	174,070	162,385	162,701
Miscellaneous	328,874	269,662	239,815
April 3	726,687	613,581	545,456
March 27	761,109	594,789	616,520
March 20	759,269	568,851	607,178
March 13	748,993	616,937	597,431
March 6	734,127	634,570	587,190
Cumulative Total, 14 Weeks	9,825,326	8,515,418	8,050,374

Car Loading in Canada

Car loadings in Canada for the week ended April 3 increased to 50,147 from 45,567 for the previous week (which contained a holiday) and 44,049 for the corresponding week in 1936, according to the weekly statement of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
April 3, 1937	50,147	28,841
March 27, 1937	45,567	29,378
March 20, 1937	48,876	29,774
March 28, 1936	44,049	25,303
Cumulative Totals for Canada:		
April 3, 1937	610,688	364,621
March 28, 1936	544,258	295,533
March 30, 1935	555,149	295,639

Photo By H. Armstrong Roberts

Time Rules Transport*

A discussion of modern features of motive power, rolling stock, brake equipment and track conditions which must be considered in the safe operation of high-speed trains

By L. K. Sillcox

Vice President, The New York Air Brake Company

THE attainment of ultra-high levels of railway speed now seems well assured, the record of top speeds having been raised in three years from a range of 80 to 90 m.p.h. to as much as 100 to 120 m.p.h. In this connection, it is instructive to recall that Stephenson nearly defeated his object, when advocating the first steam railway, by asserting that trains could be moved at a rate of 12 m.p.h. This was soon accomplished, and then began the demand for higher speed. Today, with trains running regularly at 80 to 90 m.p.h., the cry still continues.

High Speed and Safety

Railway management recognizes its responsibility in complying with all reasonable demands of the public, among which the requirement for accelerated service appears most prominently. The question to be answered is whether or not it is practicable to comply with each demand. If not, then the demand is unreasonable. Within a certain limit, any speed is practicable for which the public is willing to pay. When travelers are disposed to pay for a 12-hr. ride between New York and Chicago, approximately 1,000 miles, they can be accommodated with as high a degree of safety as they now enjoy while making the journey in 16½ hrs. That locomotives can be built which will be capable of attaining speeds of 100 to 120 m.p.h., with moderate loads, is beyond question; and we can conceive of a railway so devised as to permit such speeds with the most desirable standards of safety maintained. Such a line can be built and so operated as to render a fair return upon the investment, but it is a problem for real study in the face of the popularity of cheap fares for which the public is just now showing tremendous preference. On the other hand, it may not be out of place to refer to a few of the reasons which, on the whole, render it difficult to attain such speeds without tremendous expense.

Braking for High Speeds—One of the outstanding elements—perhaps the most important—to be considered when we start a train is our ability to stop it. If, under favorable conditions and with the most modern power-brake equipment acting upon all the wheels of a train running at a speed of 100 m.p.h., a brake application were initiated from the locomotive, then 10 sec. later the train would still be traveling at 72 m.p.h. and would have traveled 1,300 ft. It would be brought to a stop in about 1,300 ft. more, or 2,600 ft. in all. Braking performance of this nature contemplates a delay of 2 sec. from the instant the brake-valve handle is moved until the point of equivalent instantaneous maximum brake-cylinder pressure is developed and a rate of retardation of approximately 3½ m.p.h. per sec. is maintained; the average speed during the time of braking is 55 per cent of the initial speed, a ratio which has been shown to be approximately correct within this speed range for heavily braked units. The retardation rate of 3½ m.p.h. per sec. contemplates a reasonable maximum utilization of

* Abstract of a paper presented at New York University on March 31, 1937.

available wheel-rail adhesion on good rail. No standard of braking of this order has yet been realized, since no railway equipment has, to date, been fitted with an arrangement of brake foundation gear which will apply the necessary forces, distributed over a sufficient number of wheels, to relieve any individual wheel or brake shoe of excessive temperature development. Under the best actual conditions now existing with conventional brake equipment, the train would be moving at 72 m.p.h. at the end of 22 sec. and would travel about 4,800 ft. before stopping. This being a fact, it seems a waste of time to discuss the running of trains at such speeds in connection with ordinary passenger and freight traffic unless adequate measures are taken in advance to govern the movement of the faster schedules.

The Ideal Right-of-Way—It is, of course, realized that an ideal railway for ultra-high-speed runs should be perfectly level and straight, and should have a substantial and well-drained roadbed with heavy track. It should have no grade crossings or openings to invite trespassers. Also, it should have bridges with floors as solid as the roadbed itself, and stations so planned that no passenger could ever set foot on the track. It might be added that these tracks would be devoted exclusively to ultra-high-speed trains and located at a sufficient distance from all other tracks and from each other to avoid the danger, ever present under existing conditions, of an accident on one track causing a worse one on another. Add to this a perfect system of train control and cab signals. Then, with equipment constructed of the most suitable and best materials and under the most rigid inspection, it is possible to travel on such a track at schedule speeds even higher than 100 to 120 m.p.h. with comparative safety. All of these requirements can be met, but only with unlimited capital, and perhaps none of us will ever see the ideal realized.

What Is the Immediate Limit in Speed?—Passing the question of unreasonably high speeds to the theorists and to the future, it may be well to inquire whether it is practicable to make any increase in the average speed of what might be termed the best trains, such as the Century, Broadway, Olympian, Congressional, Pioneer and other Limiteds. Assuming 50 m.p.h. as the present general average and 60 m.p.h. as a special average, can we increase these speeds by, say, 25 per cent, making them 60 and 75 m.p.h., respectively, and to what extent would it involve the ordinary or local traffic? What system and appliances are necessary to bring such a condition about? Is the roadbed and track safe for such accelerated schedules and, if not, can it be made so at reasonable expense?

Modern Track Standards.—Roadbed and track are the first essentials to high-speed running, and since the improvements now being made in the tracks of most of our trunk lines are fast bringing them into a condition to make them safer for a speed of 80 m.p.h. than they formerly were for a speed of 60 m.p.h., no great amount of attention need be devoted to an analysis of this aspect; in fact, many railroads such as the Pennsylvania, New York Central, Burlington, Union Pacific, Santa Fe, and Milwaukee have already reached that condition. We have witnessed the adoption of better bridges, improved ballast, perfected drainage, heavier rails, and all parts of the track proper have improved. The number of cross ties per unit of track length has been materially increased, dangerous curves have been straightened or entirely eliminated, grade crossings are being abolished or more securely guarded, and switches are being improved and protected.

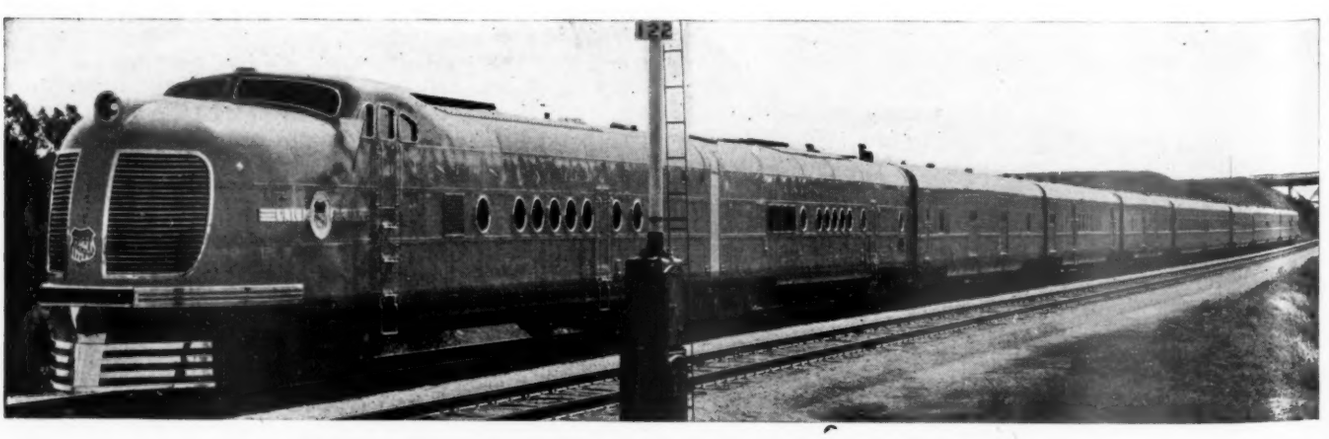
Motive Power

Few persons, other than the men who have brought the modern locomotive to its present state of development, appreciate the potentialities of the machine or the enormous quantities of power developed daily by this type of prime mover. What future development is needed in the locomotive to advance the average train speed by 25 per cent is a story in itself. It was not many years ago that the word "locomotive" was synonymous with a portable power plant, carrying a coal-fired boiler and driven by two reciprocating steam engines. This conception is maintained as the basic power for railways, but late in the nineteenth century the electric locomotive was experimentally introduced to satisfy a specific requirement.

The rapidly expanding automotive industry presented an internal-combustion engine which, passing through several stages of development for stationary industrial and marine work, ultimately emerged in a form suitable for the railway use and offered a satisfactory approach to that measure of thorough dependability which is essential to railway service. Petroleum fuels for reciprocating steam locomotives were adopted forty years ago in territories which produced the crude oils, but since no change of consequence was required in the locomotive itself to complete the conversion the mere substitution of a new fuel cannot mark an era in locomotive development.

Now the turbine-electric locomotive* will soon be operating on American railways. This locomotive will not be the cumbersome turbine unit of the past, with

* See "Steamotive Unit for Turbo-Electric U. P. Locomotive," *Railway Age*, March 20, 1937, page 468.



"Everyone Recognizes that Speed in all Things is the Order of the Day . . ."

tremendous condenser and various starting and reversing complications, but will be of a new design, operating with a steam pressure of 1,500 lb. per sq. in. in a compact oil-fired boiler and with a steam temperature of 950 deg. F. As the designs of these new units are viewed, without benefit of scanning the service record of trial locomotives of the type, the prospects of highly successful use are promising indeed. Time alone will develop the measure of suitability for varied services which they may display. Still the reciprocating steam locomotive, which has performed satisfactorily for over one hundred years and has survived thirty years of predicted obsolescence, is not seriously threatened. Its low first cost and relative simplicity assure its capacity to compete successfully with any locomotive type yet developed and its limit of sustained speed has not yet been reached.

Suitability of the Conventional Locomotive—Prospective high-speed services have produced new and unusual locomotive types. At the same time they have brought about changes in the familiar locomotive form at an unprecedented rate. Driving wheels are higher to permit high-speed running without involving excessive piston speeds. Tenders are being built for long locomotive runs with fuel and water capacities more than doubled as compared with those of the locomotives which they replace. Refinements in leading truck design insure positive stability, both in guiding and in the restriction of resonant effects in lateral oscillation. Attention has been given, as never before, to the counterbalancing of locomotive driving wheels to relieve deleterious track effects. Steam-locomotive braking has yet to be considered with full appreciation of the absolute necessity for maintaining a uniform standard of braking force with respect to weight upon all wheels of every high-speed train if freedom from sliding wheels is to be expected, while retarding at the maximum rate as governed by wheel-rail adhesion. This is a most important consideration about which many competent mechanical officers have displayed an unfortunate lack of understanding.

Advantages of Electric Traction—Electric traction, whether obtained in conjunction with a remote power source or with the prime mover installed upon the locomotive bed, does offer definite advantages. A uniform propelling torque permits the application of a constant accelerating force which may be the maximum sustainable without slippage of the driving wheels. The entire adhesive weight can be utilized for traction since it is a relatively simple matter to equip every axle with driving motors even though this is infrequently done in road service. Remote control of any number of coupled units from a single operator's station can be conveniently arranged and auxiliary drives are simplified. Both the straight electric and the Diesel-electric locomotives offer high availability as a special recommendation for their use, since periodic routine attention to the fire bed, boiler washing, and frequent replenishing of fuel and water supply are eliminated.

Economies of Locomotive Selection—The selection of locomotive type for any service is a strict economic problem, but one which is influenced to some extent by public preference in the matter of the motive power employed by the railways which shippers and travelers patronize. There is a high first cost with consequent high annual capital charges, on the one hand, offset by a higher thermal efficiency which may be shown for the Diesel, and the saving in maintenance of way and structures claimed for the straight electric as a result of its characteristic cleanliness in operation. The high thermal efficiency of the central generating station and the efficient conversion of electrical energy to mechanical forces at the rims of the wheels, where electrification of steam lines has been completed, is burdened with transmission losses in the distribution system.

"Roadbed and Track are the First Essentials to High-Speed Running"

Unique Versus Conventional Locomotive Design—The requirement for high speed has sometimes been advanced as the reason for departure from the reciprocating steam locomotive. However, restricted speed potentialities need not be advanced as a peculiar limitation to its capabilities except, perhaps, in certain cases where extended mileage of curved track prevails. Here the lower center of gravity of the electrically driven locomotive sometimes permits the maintenance of higher schedule speed with safety. There is still so much to recommend the steam locomotive for railway motive power, that the men of vision in railway mechanical departments will assist to the utmost in the further development of the basic design, co-operating with the builders to perpetuate a form which has served so well and which holds much promise in satisfying prospective needs.

Sustained High Speed—With motive power capable of maintaining the average speed on the ascending grades existing on nearly all railways, it appears possible to advance the average speed to 80 m.p.h. without any actual increase in the rate which we are daily reaching, at least for short favored distances. We really need more power in the locomotive rather than a higher top speed, and it has been found possible to bring this about. Otherwise an increase of 25 per cent in the average means a top speed which may go beyond the reasonable safe limit over many existing routes. In other words, we can best increase the speed by making it more uniform and sustaining it throughout the run.

Functions of the High-Speed Brake

Next in order and importance, after getting our locomotive to give us the speed, comes the brake to control it. Notwithstanding the wonders already achieved, much remains to be realized in this direction as has been demonstrated on the few successfully braked trains now in high-speed operation. Trials have demonstrated that at 100 m.p.h. a braking force double that usually employed on conventional trains operating at 60 m.p.h. can be used with security from wheel sliding, if properly controlled, and emergency stopping distances no longer than the minimum attainable should be considered. We must have that force and it must act to produce a uniform retarding force in relation to the weight borne by

every axle. In addition, we must of necessity, have an automatic retardation control device to regulate brake-shoe pressure according to its effectiveness at every stage of the stop so as to avoid sliding of the wheels and consequent loss of efficiency. Thus, all parts of the brake and running gear must be strengthened to withstand the increased force to be applied. For emergency stops, we must have a positive and ample supply of sand automatically applied simultaneously with the air brake under all wheels except on the leading trucks of steam locomotives.

Automatic Safety

Our next problem is to remove as far as possible every known danger from the path of the train, and guard against such dangers as cannot be avoided by utilizing the best appliances and construction. Overhead or underground passages should be provided at stations and crossings where possible, and measures should be adopted to compel their use. Where grade separation of crossings is not practicable, every reasonable precaution must be taken to protect against interference. Facing switches should be removed except where they are absolutely necessary, and whenever allowed to exist they should be protected by an interlock or electric signal, or both. All sidings should have derailing switches at the fouling point, connected with the main-track switch. At drawbridges, junctions, and all other points where the tracks must frequently be broken and obstructed, there should be a system of interlocking switches and signals, and the entire line should be protected by some adequate system of block signals, automatic train control, or cab signals, a purpose to which the electric track circuit seems best adapted since it provides a suitable safeguard against the widest range of possible dangers and is the least dependent on human agency for faithful performance of its function. Signals should be uniform in form and meaning, and care should be taken not to multiply them needlessly. Automatic stop devices, operating in connection with all fixed signals which may display a stop indication, should apply the brakes and bring trains to rest whenever the signal indicates danger, independently of any action on the part of the engineman.

The Parallel Track Hazard—It would appear that with such improvements and with the additional safeguards which have been enumerated, railway operation should be reasonably safe; but we have yet to meet and overcome one of the most serious, potential dangers, and one that has never received the consideration that it merits. This danger is found in the presence of passing trains, particularly freight trains, running on adjoining tracks seven feet or less apart. Whatever may be done to improve roadbed, track, signaling equipment, or motive power, efforts toward ideal safety standards cannot be completely effective as long as there is danger of an obstruction being thrown on the track by a mishap to a train on the adjoining track. Whenever a fast passenger train meets and passes a freight train running on the opposite track it is subjected to a possible accident, even though the likelihood is quite remote. Many frightful mishaps have occurred from this cause and unless a remedy is applied their number must increase with any substantial and simultaneous advance in the density of traffic and the speed of trains.

The remedy resides in one of two directions. We must separate parallel tracks or positively prevent accident to the freight train. To carry out the latter aim, it is necessary still further to raise the standards in freight equipment. Quality rather than price must govern the selection of material for its construction. All old or weak cars and appliances must be discarded, and the freight car must be made to carry its traffic with the same degree of safety which is exhibited by the passenger car. Breaking apart of the train due to deficient couplers and draft gears, or as the result of unnecessarily continuing obsolete brake designs in service, form a fruitful source of trouble and these specific elements are perhaps directly or indirectly responsible for more accidents and delays than all other details of the equipment combined. Stringent regulations have been adopted and enforced to prevent overloading and improper loading of cars, and better means have been provided for securing all such freight as must be carried on open-top cars; in fact, whenever passenger and freight traffic are both conducted over the same or adjacent tracks, equal care for their safe movement must be exacted.

What effect an increase of 25 per cent in schedule speed of passenger trains may have on local traffic is an important consideration, and can only be judged by the volume and character of the service obtaining. In many instances it will mean an equal increase in speed of local passenger trains; otherwise, it will be necessary to repeatedly shunt such trains to passing sidings to prevent interference with the schedules of through trains. Trains would soon become bunched under such circumstances, and a general demoralization of the train service would ensue. The speed of these trains can be advanced, but the cost of such increase must be considered as vital to the question at issue, and in this calculation the rapid rate at which train resistance increases beyond 60 m.p.h., will serve as an important consideration.

Air Resistance and Streamlining

The force required to overcome the total air resistance of a steam locomotive alone increases about two-thirds between 40 and 60 m.p.h. and slightly over one and one-half times between 40 and 80 m.p.h. At the same time, the air resistance increases 80 per cent between 40 and 60 m.p.h. and 225 per cent between 40 and 80 m.p.h. These figures relate to a steam locomotive of conventional design. If partially streamlined after the manner of the New York Central "Mercury" and "Commodore Vanderbilt," or the Milwaukee's "Hiawatha," air resistance at 40 m.p.h. is reduced almost 50 per cent and the increases with speed become 112 per cent from 40 to 60 m.p.h. and 300 per cent between 40 and 80 m.p.h. Streamlining is effective even though the ultimate form cannot be practicably attained. Its practical value is often overestimated, however, since the actual percentage saving in air resistance is of little meaning with respect to a locomotive hauling a train on steel rails. It is the relative economy in total resistance which defines the actual benefit and this is sometimes disappointing.

No practicable degree of streamlining can completely offset the inevitable increase in power requirements necessary as schedules are accelerated. A higher ratio of installed power to train gross weight is essential, provided either by larger locomotives or by reducing the weight of the train and thus its revenue capacity. From whatever standpoint the subject may be considered, it must be evident that high speed can be offered without insuperable technical difficulty—but at its price.

Conclusion

The question, "How fast is too slow?", must be determined by each railway manager for himself, and not by the public. The average traveler carried at 80 m.p.h.

(*Continued on page 682*)

Costs to Control Competition*

Where railways have rivals, regulators need acceptable comparable cost data to mold just rate structures

By Arthur F. White

Assistant Director, Bureau of Statistics, I. C. C.

ALTHOUGH "Cost finding" is the subject of this discussion, so many of my friends in transportation make wry faces and swallow the word "cost" with difficulty that I use the phrase, *"expense of service analysis,"* which describes the process much more accurately. There is a difference between this type of *cost finding* and the detailed *cost accounting* methods which were so much in vogue a few years ago among industrial engineers.

Of What Use Are Cost Figures?

The first question I am asked is, "How would you use the costs of transport services if you had them?" It would have been difficult for me to answer that question conclusively a few years ago when railway competitors were generally free to make whatever rates they chose, and the cost of transport was seldom considered in making railway rates, but passage of the Motor Carrier Act and the trend toward rate regulation of all forms of transport have changed that situation.

It is now the duty of the Commission to foster sound economic conditions in transport and promote adequate, economical and efficient service without unfair or destructive competitive practices. Where keen competition exists between railway and highway carriers, and the rates charged for a particular traffic have been forced down to levels so low that neither transportation agency is earning its full operating expenses, taxes, and a fair return on the investment, an upward adjustment in those rates would be very difficult to justify without analyses of the carrier expenses.

Other uses of expense analyses by the Interstate Commerce Commission in recent cases have been those involving terminal switching, special services such as refrigeration and interchange of traffic with the Mississippi River Barge Lines, and interterritorial divisions. However, in most of those cases the *expense analyses were submitted by carriers individually or by groups of carriers or shippers, based upon methods of assignment and apportionment which vary so widely as to make comparisons impossible,* with the unfortunate result that the figures have not been accepted with confidence, and often have been almost disregarded in the decisions reached.

Opinions may differ as to how competitive rates should be adjusted in each particular case and, so far as I know, the Interstate Commerce Commission has not issued any statement of policy, but my personal views can be summarized briefly in three principles.

1. No carrier should handle any traffic at less than the direct out-of-pocket cost.

2. For any particular commodity movement shared with competitive agencies, at least one of those agencies should earn its full operating expenses, taxes, and a fair return upon its investment. I do not mean to imply that maximum rates should be limited to the full costs of the cheaper carrier. There are many other factors affecting maximum rates which I shall not attempt to discuss.

3. For any particular movement the so-called higher cost transportation agencies should be allowed to meet the rates established by the cheaper operators, if those rates will enable the higher cost operators to earn something above their out-of-pocket costs.

To apply these principles in any particular rate proceeding it is, of course, necessary to obtain cost data for each transportation agency involved. Two such cases are now before the Commission—Docket 27565, Petroleum Products from California to Arizona, and Docket 27571, Naval Stores from Mississippi to Gulf Ports. The Bureau of Statistics has been assigned the task of gathering and summarizing the cost data, and our problem is to obtain an analysis of the expenses of each type of service sufficiently accurate to warrant the confidence of the carrier and Commission officers, with a minimum disturbance to carrier accounting routines and a minimum cost for carrier preparation of the necessary exhibits. I shall describe a little later the methods to be used in accomplishing that result.

Suggestions as to methods to be used in analyzing expenses with sufficient accuracy to warrant confidence in the results, but without burdening the carriers for unnecessary detail, have been studied by the Bureau of Statistics for many years. Progress has been slow, but several important steps have been taken during the past two years, partly as the result of experience gained in the preparation of reports to the Federal Co-ordinator of Transportation.

The Recent Statistical Changes

The first step was the improvement of the rules for separating freight and passenger expenses which had been effective since January 1, 1920, but were not satisfactory to most carriers. Through the co-operation of the Accounting Officers' Association, mutually satisfactory agreements were reached on each point, and the revised rules, were made effective January 1, 1936. All of those who participated in the conferences recognize that further improvements can and should be made from time to time as our knowledge of the factors influencing costs increases, but the Commission and the carriers now seem willing to accept with reasonable confidence, the separation of expenses between freight and passenger services.

A second step was the revision of the Commission requirements for annual reports of operating expenses to provide for the separation of track maintenance expenses between yard switching, way switching, and

* Abstract of a paper read at round table conference of Railway Accounting Officers, Washington, D. C., March 26, 1937.

running tracks instead of confining the separation to "Yard and other tracks."

A third step was the amplification of the Commission's requirements for operating statistics to show the ton-miles in freight service handled by coal-burning, oil-burning, electric, and other locomotives separately as well as the cost and quantity of fuel and power used by those locomotives.

A fourth step, which has not been completed, is the preparation of forms for standard expense analysis exhibits to be submitted by railway and highway carriers in all cases where such data is required by the Commission.

The railway forms to be used—when, as, and if the carriers or the Commission desire to localize the expenses—will provide for the assignment and apportionment of system freight expenses between accounting divisions, and the further separation of such expenses between road, yard, water transfer, station, special services, overhead, and taxes.

The highway carriers' forms will provide for the assignment and apportionment of system freight expenses between types of vehicles, stations, and overhead; and the further separation of vehicle expenses between routes.

Giving Expense Analyses Real Value as Evidence

In the Petroleum and Naval Stores cases previously mentioned, it is planned to send the expense analyses exhibits to the carriers in the form of a questionnaire to which the answers should be filed at the hearings by witnesses under oath who will be subject to cross examination by counsel for opposing interests and the Commission. Later the returns will be checked and summarized by the Bureau of Statistics for the use of the Commission's examiner in preparing his report.

In the Petroleum case three railways and ten highway truck operators are handling the traffic and will be required to furnish the expense analyses. During the month of January this year I personally called upon the officers of each of those carriers and discussed with them the tentative forms.

Railway accounting, operating, and traffic officers, as well as their counsel, all expressed approval of the suggestion that the Commission provide standard expense analysis formulas to be used in preparing the required exhibits, supplemented by such other exhibits as the carriers may desire to furnish. The railway officers as well as the officers of the Bureau of Statistics have long been aware of the futility of preparing elaborate and expensive exhibits based upon formulas never approved by the Commission and therefore given little if any consideration by the examiners who lacked confidence in their accuracy and suspected that the apportionment methods used were those selected after trial of several factors to determine which would produce the desired result.

One vice president and chief counsel stated to me that, in his judgment, the use of Commission prescribed expense formulas would be a marked improvement in the procedure for handling Commission cases and that, within a few years when these formulas have been tested and approved by the courts, most of the controversies over transportation cost finding methods would disappear.

Highway carrier officers and their counsel also promised full co-operation and expressed keen interest in obtaining reliable data not only as to the expenses of railway services, but also as to the expenses of the various highway services.

Some doubt has been expressed by railway and Commission officers as to whether the highway carriers, in the absence of a standard classification of accounts, could readily provide the expense data desired. I am glad to be able to report that all of the highway operators handling petroleum from California to Arizona maintain quite complete records. Four of the ten operators have large fleets in service throughout California, Nevada, and Arizona. The other operators have only a few tank trucks and tank trailers. However, all of them assign most of their expenses direct to the individual vehicles and from their mileage records it is a comparatively simple task to determine the expenses applicable to the service between California and Arizona.

Some of you are familiar with the studies of highway trucking costs recently published by the California Railroad Commission and with that Commission's recent decision, which ordered substantial increases in the minimum rates charged by both highway and railway carriers for the intra-state transportation of gasoline and other petroleum products. Some of the most important features of that decision include the establishment of two separate minimum rate scales on a mileage basis; one scale for the railways and one scale for the highway operators. The railway scale is higher than the highway scale for distances up to 300 miles, but for longer distances it is lower than the scale for the highway operators. At competitive points the carrier to which the higher rate scale applies is permitted to meet the rate charged by the competing agency. In making that decision which, in effect, establishes highway operations as more economical than railway operations for distances up to 300 miles, the California Commission stated that it had no confidence in the cost figures submitted by the railways, but was guided with respect to the railway rates principally by comparisons with interstate rates for similar distances fixed by the Interstate Commerce Commission. For the highway rates the California Commission relied upon its own cost studies.

It seems apparent that if separate rate scales are to be established for railway and highway transportation the rate of progression and the distances where those rate scales cross should be based upon detailed analyses of the expenses of each type of carrier. I hope to receive the hearty co-operation of accounting officers in developing methods for analyses of railway expenses which will produce data worthy of the confidence of those who need the figures to guide them in making such decisions.

Further Standard Break-Downs in Expenses Needed

Some of the particular problems in which we need the help of the best railway experts are:

1. Simplification of the methods heretofore used for analysis of switching costs, without impairing the accuracy of the results.

2. Establishment of standard ratios for apportioning track maintenance expenses between various classes of tracks.

3. Establishment of standard ratios for apportioning freight car maintenance expenses between running services and switching services.

4. The subdivision of a few of our primary accounts so as to separate unlike items; I have in mind particularly the account for maintenance of stations and office buildings, which also includes small grain elevators, ice houses, stock pens, etc.

In the solving of each of these problems I see no need for maintaining routine records or for meticulous accuracy. We are all familiar with the standard practice in the United States of computing switching locomotive

(*Continued on page 682*)

Supply Work Highly Organized on Santa Fe

Keep tab on commodities bought—Book of Standards simplifies lumber buying—Make quick work of mailing

Part III

Delivery Books Segregate Purchases by Commodities

Invoice Books Segregate Purchases by Dealers

This article concludes a series of three, begun in the *Railway Age* of March 27 and continued in the issue of April 3, describing the organization and methods employed in purchasing work for a 13,000-mile railroad that spent over $35,000,000 last year for material and supplies. While making no pretense of telling the story of Santa Fe supply operations completely, the series gives more than a bird's-eye view of the purchasing problems of a large carrier, and affords a practical understanding of many of the details which have enabled the road to do the work with recognized thoroughness.

IN addition to all the records made to control and guard the procedure of buying, a delivery record is maintained in which the purchases of several hundred different commodities are shown progressively. A separate page is reserved for each item and the record is made by entering in separate columns on the page the name of the shipper, the date of the invoice, the order number, the quantity delivered, the unit price and the total cost. Totals can be struck at any time to show both quantities received and expenditures.

Signal material buying is facilitated by a book of standards prepared by the signal department, containing blueprints and other reference data on all equipment and parts in common use on the system and showing the items which have been made obsolete or are interchangeable.

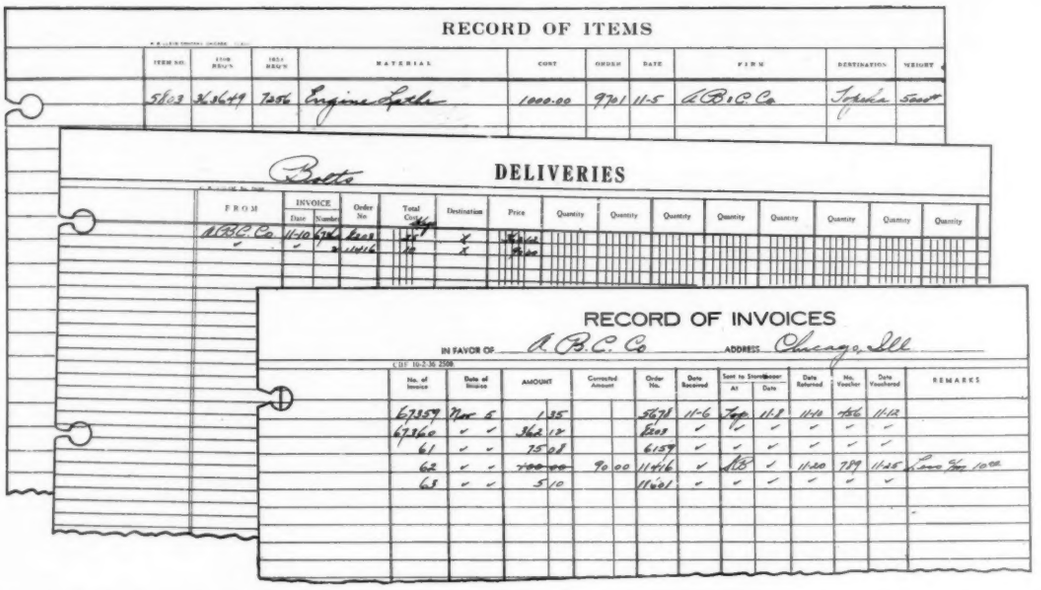
A Catalogue for Lumber

The purchasing of lumber is facilitated by a blueprint catalogue prepared by the car department and kept to the front in the tie and lumber sub-department of the purchasing office, giving the standard sizes of all car lumber and the required or optional grades and species for each purpose. The Santa Fe has a lumber buyer in the Douglas fir territory; and in practically all instances where soft woods are involved, competitive prices are obtained on Douglas fir and yellow pine. The fir prices are f.o.b. cars at the mills, and the freight to the rails of the Santa Fe at Denver, Colo., is added to compare the quotations with bids on yellow pine f.o.b. Santa Fe rails.

When writing lumber orders, one copy is prepared for the store department and another copy for each lumber inspector, and a special lumber delivery book is maintained. While not attempting to show separately the quantity of different items of lumber received, the book shows all receipts of car lumber, divided between yellow pine, Douglas fir and car oak; the amount of bridge and building lumber, divided as to yellow pine, Douglas fir and oak; and also shows separately the receipts of piling, poles and posts, crossing plank, grain doors, switch ties and crossties. This delivery record shows the division of orders between different purchasing districts on the Santa Fe lines and provides a valuable history of lumber purchases for use in engineering studies.

Consolidate Letters

Speed and economy in mailing are promoted by a simple but ingenious steel rack attached to a side wall in the purchasing office. This rack is approximately 10 ft. long and 5 ft. high and consists of 480 letter-size vanes of steel placed one above the other. Each vane is set at an angular position with the wall and is tilted upward so that letters need not be pushed into the pocket, as in a pigeon hole, but can be dropped into the compartments from the side. A pocket is reserved for a single firm

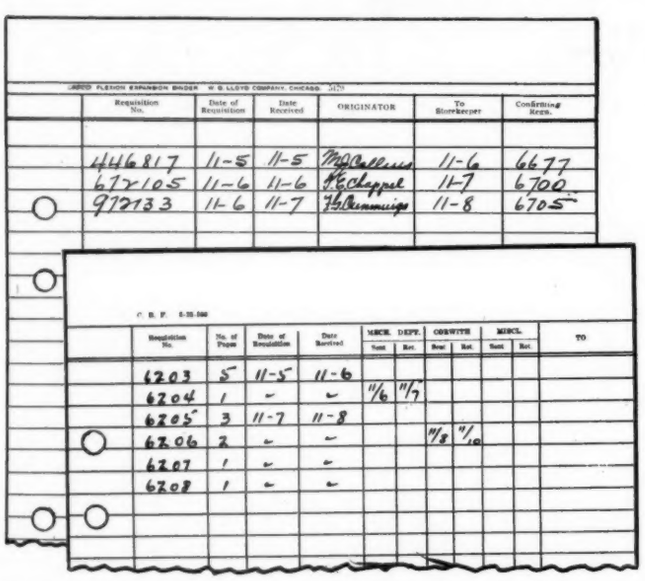


Top—Ledger Record of All Machines Requiring Special Authority to Purchase. Center—Sample Page from Delivery Record, One Page for Each Commodity. Bottom—Sample Page from Invoice Record, One Page for Each Dealer

and is identified by a label. All orders, requisitions and other correspondence directed to firms each day are placed in the proper pockets and at the end of the day this mail in each pocket is all placed in one envelope and the address applied with a rubber stamp attached to the bin. This procedure avoids confusion in mailing and saves postage.

Stamps Reduce Typing

A sidelight on Santa Fe purchasing that deserves more than passing notice is the use made of stamps. While stamped *signatures* are taboo, several hundred stamps are used for addressing envelopes in the mailing department. Stamps are also in constant use in the order and invoice departments where they save much typing, emphasize special instructions which some orders require, and supply information missing from invoices. The stamps used in preparing purchase orders number 15. One stamp reading "Future orders depend on the proper packing, marking and loading of this freight" is applied to all orders except those for fuel and grain, to assure that material will be neatly packed to facilitate easy handling. Another stamp reads: "Important! Material subject to acceptance by our inspector prior to shipment. Certificate of inspection must accompany each invoice. Notify J. L. Armstrong, general material inspector, Chicago, for inspector three days in advance of when material will be ready."



Upper—Loose Leaf Forms for Keeping Records of Special Requisitions Which Originate in the Purchasing Department Instead of the Stores

Lower—Purchasing Department's "Ready Reference" Record of Requisitions Received from Stores. A Separate Series of Numbers for Each Store

A list has been provided by the general inspector to cover all material subject to inspection. This list includes all castings, with the exception of those made of grey and malleable iron. It includes all signal wire, stranded wire, solid wire and shop wire, with the exception of patented wire, and also covers incandescent lamps, petroleum asphaltum, wheels, bearings, and many similar articles. The stamp is applied to all orders calling for these materials. A similar stamp is applied to orders for cement and other materials to be inspected by the engineer of tests.

Another stamp reads: "Express receipt on shipping tags must show routing by way of A. T. & S. F. Ry. at nearest connection point and original or duplicate of express receipt attached to invoice." This is applied to all orders calling for express shipments. Another stamp reading "Copy of bill of lading or express receipt must accompany your invoice" is applied to all orders on railroads to furnish material for repairing foreign cars. Another stamp reading "Please notify C. F. McClure, Arkansas City, Kans., when the above material is ready and he will furnish full and complete inspection" is applied to all orders that call for gasoline and fuel oil requiring company inspection and to all material to be loaded in the company's tank cars. Another stamp reading "Shipping notice to be mailed to M. J. Collins, Chicago, in duplicate on the day shipment is made" is applied to all orders for materials that are consigned to a destination other than the final destination. This practice is followed wherever the Santa Fe can benefit by resorting to through freight rates and reconsignments. Immediately upon receiving the shipping notice, the purchasing department notifies the freight agent in question

to reconsign the shipment to its final destination on company billing.

Another stamp reading "Please do not duplicate this order" is applied to all orders for material that have already been shipped to the railroad, as where emergency shipments are pre-arranged by telephone or telegraph. Another stamp reading "Please do not prepay freight but permit charges to follow car and make allowance on your invoice for local freight charges to our line" is applied to all orders calling for minimum carloads and carloads for shipment on the Santa Fe lines. Another stamp reading "F.o.b. Santa Fe tracks" is applied to all orders where the price is quoted on the basis of delivery to the company's tracks at Chicago or any other place on its line. Another stamp reading "Important! If necessary to manufacture pipe, serial number must be shown on each piece" is applied to all orders placed for cast iron pipe.

Another stamp reads: "Ship by deadhead express all shipments up to 20 lb. originating on and destined to points on the Santa Fe system. If more than 20 lb., ship by freight." Another reads: "If shipments originate from points off our lines, send as follows: 5 lb. or less, parcel post; over 5 lb. and including 20 lb., ship Railway Express Agency routed Santa Fe nearest point. All shipments over 20 lb. ship freight." Another stamp reading "Replacement No charge" is applied to all orders for material to replace defective material, while another stamp reading "No charge" is applied to all orders on firms that have agreed to furnish certain materials without charge for experimentation or other reasons.

Steel Mailing Rack Where Outgoing Mail Is Sorted. Note Labels Giving Firm Name and Rubber Stamp in Each Pocket to Address Envelopes

From Date to Delivery

Precise information is not available on the full effect of the use of contracts, advance prices and other devices to expedite the supply work and promote economy. It has been roughly estimated, however, that in *dollar* volume, about 60 per cent of the purchases are covered by contracts, while about 25 per cent of the business involves material covered by quotations obtained ahead of requisitions. Orders for about 85 per cent of the material in dollar volume are thus prepared without the delay required to make formal inquiries for competitive prices after requisitions have been received. About 10 per cent of the purchases require special inquiries, while preliminary agreements are made by correspondence on about 5 per cent of the business. When it is considered that the detail of issuing inquiries, tabulating the bids and selecting successful bidders requires about 10 days, the advantages of these arrangements are apparent.

A check was made of the first 140 requisitions received in May, 1936. These requisitions were all prepared at Topeka, Kans., the nearest general store to Chicago. A total of 364 purchase orders were made from these requisitions, representing about 2 orders per requisition; while the invoices numbered 461, an average of 1.5 invoices per order and 3 invoices per requisition. The average time taken by the requisition to reach the purchasing office was 2.7 days, the average time from the receipt of requisitions to the placing of orders was 4.5 days, and the time from the date of order to the date of invoice averaged 14 days, a total of 21 days from the date of requisition to the date of invoice. No check was made of the time taken by requisitions to reach the purchasing department from more distant stores or of the time taken by material to reach destination after the date of invoicing.

A total of 701 requisitions handled in a 10-day period included 3,695 items, or 5 items per requisition, the number of items varying from one on some requisition to 100 on others. Materials appearing on the requisitions and the quantities in which they were ordered were as follows:

10,000	gal.	Cleaning oil	100	gal.	Spray lacquer
8,000	gal.	Valve oil	375	gal.	Varnish
96	gal.	Sealer	6	lb.	Vaseline
50	gal.	Varnish	400	lb.	White waste
500		Coil springs	25		Tin cans
20		Tension rods	100		Brake beam keys
12		Brake beam heads	36		Garden rakes
6	cans	Soda	1		Grease gun
6		Door hinges	1,000	lb.	Anti-foam compound
10	lb.	Potash	12		Draft lugs
3,000		⅜ x 1¾ nuts	1	set	Piston rings
1,500		⅜ x 1¾ carriage bolts	1	car	Furnace oil
60	gal.	Enamel, black	3		Tool dies
20	gal.	Enamel, green	1		Pulley
10	qt.	Lacquer	2		Drills
50	gal.	Pointing	40		Wheel washers

A review of the work of the purchasing department invites some reference to evidences of the accuracy of performance. Both records and office procedure are periodically subjected to test checks by the auditing de-

partment and all errors found are investigated. Reference is made to the test check of accounting practices in the purchasing office during the first six months of 1936. No exceptions were taken to the completeness of the invoice record. Neither did a comparison of quantities, descriptions of material, prices shown on typical invoices and their corresponding orders cause any complaint. A few invoices were out of the files, but with one or two exceptions they were located in correspondence files or among papers under investigation. An examination made of all invoices registered from January 1 to July 10, 1936, to discover invoices on record for more than 60 days, which had not yet been returned for voucher, showed only 8 invoices on which no action had been taken to determine the reason for the delay. A comparison was also made of a large number of quotations received from printers, stationers, lumber dealers, feed dealers, and various manufacturing firms, and in all cases examined it was found that the purchases were either awarded to the lowest bidder or a satisfactory explanation given. Invoice prices were checked with the prices shown on orders and no errors were found.

When the Santa Fe gave permission to study its purchasing methods and present in these columns information calculated to be of interest and value to readers, the chief of the supply department opened the study by calling his staff together to hear the proposals and to discuss informally the methods of procedure. Meetings of this nature, it was explained, are customary in the administration of the departmental work and are designed to familiarize the organization with policies and to develop first-hand information on the progress of or difficulties in the work. This practice is said to have contributed substantially to the stability and degree of coordination which has marked this road's supply operations for many years.

Time Rules Transport

(*Continued from page 676*)

has little thought of the conditions necessary to insure his safety, a fundamental achievement of our railways and one which, in view of the deplorable showing in other forms of high-speed transport, the public is beginning to comprehend and value as never before. The lowest consistent fare is a universal demand on the part of all travelers, and the volume of the traffic secured is practically a function of the travel cost. Therefore, we have a balance to consider between cost, speed, and safety. The steady increase in traffic calls for improvement in system and appliances to enable an increase in schedule speed consistent with safety and economy. These requirements should be met before making an attempt to increase top speeds. Everyone recognizes that speed in all things is the order of the day, but genius and common sense are needed in evaluating its costs and formulating the procedure to meet this end.

Costs to Control Competition

(*Continued from page 678*)

mileage at six miles per hour. Such a figure should of course be verified occasionally by representative tests, but the average is used with confidence wherever locomotive mileage figures are found.

Is Yeager Formula Out-of-Date?

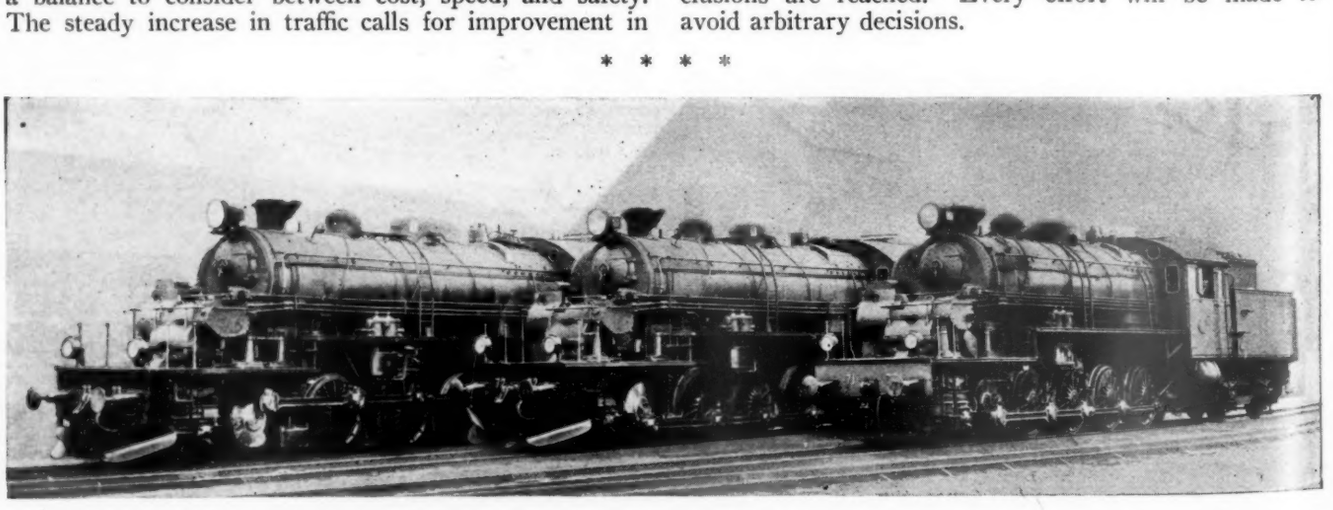
Another important problem upon which we need all the help we can get is that of out-of-pocket costs as distinguished from full distributed costs. Here again meticulous accuracy is neither desirable nor expected. Each class of expense should be analyzed separately, however, to determine the extent to which it is affected by fluctuations in the volume of traffic. For example, the Yeager formula of 1919 expresses the judgment of experienced railway engineers that only one-third of the maintenance of way expenses are affected by the volume of traffic. The business depression of the past 7 years has taught us many things and I suspect that a careful study of maintenance during the period from 1929 to 1936 might result in a revision of the Yeager formula.

Similarly, a study of through train and way train expenses separately is needed to determine the relationship between the direct out-of-pocket costs of those services and the volume of traffic measured in ton-miles or car-miles.

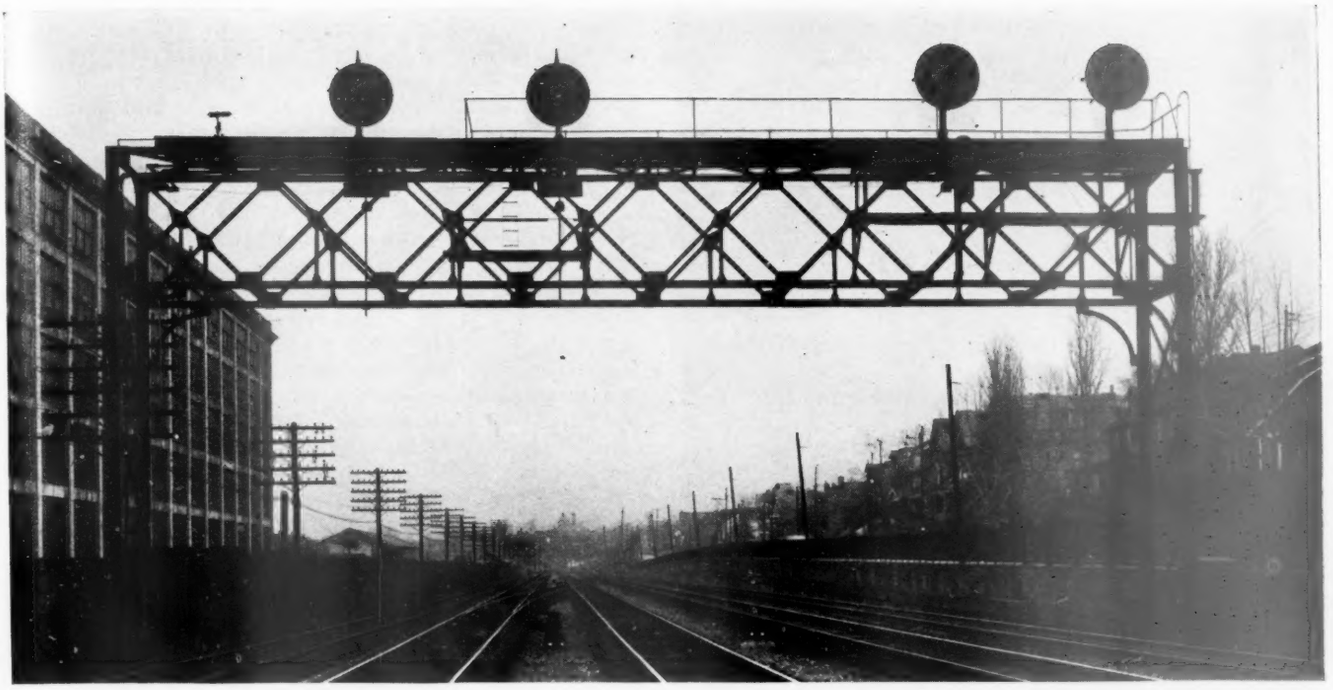
All of these studies will take time, but they need not be expensive. By using the results obtained it may be that we can avoid the maintenance of expensive detailed records which would otherwise be required.

Finally, may I assure you that it is not the intention of the Bureau of Statistics nor, so far as I am informed, of the Commissioners, to proceed hastily in the matter of establishing requirements for expense analyses. Each step will be carefully considered, and sample tests made for discussion with carrier representatives before conclusions are reached. Every effort will be made to avoid arbitrary decisions.

* * * *



Ljungstrom Non-Condensing Turbine Locomotives in Sweden—Locomotive No. 71 Was Placed in Service in 1932; Nos. 72 and 73, in 1936



Westward Home Signals at WK, Swissvale, Pa.

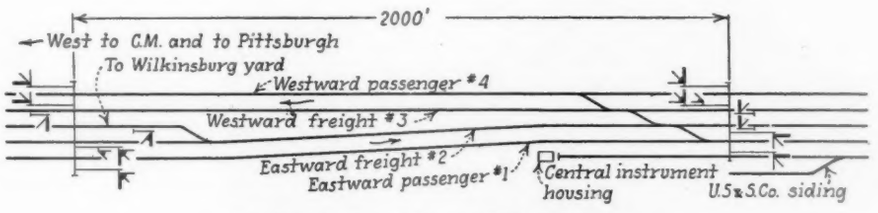
Remote Control on Pennsylvania

Plant on four-track main line, involving three crossovers, one single switch and signals, is all handled from machine 2.5 miles away

AT WK cabin, near Swissvale, Pa., the Pennsylvania had a 23-lever electro-pneumatic interlocking to handle the switches and signals for a track layout involving seven crossovers and a single switch on a four-track main line. The normal daily traffic through the WK plant averages 121 eastbound and 116 westbound trains, counting through trains and switching movements. This total includes 84 eastbound passenger and 70 westbound scheduled passenger trains; and of this total, 33 westbound and 25 eastbound passenger trains are operated during the first trick.

One of the reasons for installing this track layout at WK was to permit routing trains from one main track to another so as to effect run-around movements between this location and CM cabin, which is 2.5 miles west of WK. On the average, about three or four such run-around movements are made on each trick daily. A second reason was to provide a place to cut off the helper engines that are used on tonnage freight moving westward on the ascending grade from Pitcairn yard to Swissvale, where they are cut off and switched over to an eastward track for the return trip to the yard, from 8 to 10 such movements being made daily. Furthermore, certain suburban passenger trains operated out of Pittsburgh end their runs at Swissvale station just east of WK, and are then crossed to a westward track for the return trip to Pittsburgh. In addition to the crossovers, the WK plant includes a turnout for a tail track located between tracks No. 2 and No. 3, and leading to a freight yard at Wilkinsburg. This tail track is used primarily to bring eastbound freight trains out of this yard onto an eastbound track, four or five such movements being made daily.

The operation of WK interlocking was discontinued in 1931, but early in 1936, following an investigation of the train movements, it was decided that it would be



Track and Signal Plan of WK Interlocking

The C.T.C. Type Machine Stands at End of Interlocking Machine in CM Cabin

entirely practicable to control the switches and signals at WK by a C.T.C. type control machine to be located in the operating room of the tower at CM, 2.5 miles west of WK. In the meantime, while WK interlocking was out of service, new 131-lb. rail had been laid on some of the main tracks throughout the plant, and as these changes were made, some of the old frogs and switch layouts were removed.

When the new remote control installation was authorized, new No. 20 turnouts, with 45-ft. reinforced switch points, were installed. In order to operate the 45-ft. points properly, a second operating connection was provided, being attached to a second head rod set 22½ ft. from the point. The position of the switch points at this section is checked by an additional switch circuit controller. As a mean of reducing the operating load on the switch machines, the new Union type roller bearings were installed under the switch points. New low-pressure A-1 switch movements with CP switch valves were installed, and in order to bring the layouts up to present standards, point detectors were added. The signals and signal bridges were cut back into service as interlocking signals with no important changes or additions, modern position-light signals having been in service at the plant previously.

The existing tower building at WK was of brick construction up to the floor of the operating room, and of frame construction for the upper story, and as it was no longer of service as an interlocking tower, it was decided to remove the upper story and install a new roof, and thus provide a fireproof structure to house the instruments, installing new cabinets for this purpose.

The equipment includes new local relays, controlled by the C.T.C. system, which were required to effect the control formerly accomplished by the old interlocking machine. A set of 12 cells of Edison A4H storage battery serves as a source of energy for the operation of the local relays at WK, the load being about 1.5 amp. The compressed air for the operation of the switches is provided by a set of compressors, consisting of duplicate 35-cu. ft. compressors driven by 7.5-hp., 220-volt a-c. motors. The outside wiring of the old WK plant remained in place practically as it was.

The control of the entire interlocking, as well as the return of indications to the control machine, is accomplished by the Union two-wire time-code system, using two No. 14 wires in an existing underground cable between WK and CM cabin. When this installation was under consideration, a study was made as to the practicability of using a direct-wire control scheme, but it was found that a new 61-conductor cable, 2.5 miles long, would cost more than the entire project, using the code system.

The new C.T.C. type control machine for the control of WK is located at the west end of the 59-lever electro-pneumatic interlocking machine at CM cabin. This C.T.C. machine has four levers for the control of three crossovers and one single switch, and four levers for the control of signals. The illuminated track diagram, above the levers, reproduces the entire track layout and approach sections at WK. Although about 237 train movements are made through the WK plant daily, a large majority of these operations are through movements on straight track. Therefore, the controls of the signals are arranged to operate "non-stick", so that the signals will clear for following train movements automatically without the leverman's attention. If the route is to be changed, the leverman can make the signals operate "stick" by pushing a stick button and leaving it at the "in" position.

This remote control installation was planned and constructed by the signal forces of the Pennsylvania, the major items of equipment being furnished by the Union Switch & Signal Company.

The Switch Points Are 45 Ft. Long and Are Equipped with Roller Bearings in Order to Reduce the Operating Load

Communications . . .

The Railway Age cannot publish letters from readers who do not supply their names and addresses. Names of correspondents are not published, or disclosed even upon inquiry, unless the correspondent consents. But they must be given us as an evidence of good faith.

Ohio Dams—Pro and Con

ROANOKE, VA.

TO THE EDITOR:

I was much interested in your article in *Railway Age* of March 6, 1937, the facts given and the deductions therefrom; especially this quotation from that article:

"The significant point in these figures in that when the flood started to hit the vicinity of Louisville the pools were full."

There is something to this, no doubt, but the most significant thing is that the dams decreased the fall of the river for some miles above them, which necessarily slows up the current of the river so that the waters from behind catch up and pile up. This fact of slowing up the flow of the river, plus the speed and momentum of waters behind was the most significant cause of the flooding of Louisville. Other dams did the same thing for other localities.

Twenty dams had the effect of slowing up the speed of the river throughout much of its length and therefore waters that should have passed on remained to be added to the oncoming waters. One dam at one point slowing up the current of the river is truly bad enough, but twenty dams will have a progressive and cumulative effect possibly greater than twenty times one dam.

There cannot be the slightest doubt but that the dams were the true cause of the excessive floods of the Ohio river last January and early February. The further down the river the greater the excess of waters until the last dam is passed. Speed of the flowing water is the most significant fact. The blasting out of the dams and removal of debris would be the cheapest and best way to remedy future excessive floods of the Ohio river.

D. E. REMSBERG, M. D.

COLUMBUS, OHIO

TO THE EDITOR:

The following relates to your article on page 388 of the March 6 *Railway Age* on "Severity of Ohio Flood Due to Navigation Dams?"

The claims of this emotional article are entirely disproved by the findings sent out by the War Department under date of March 8, under the heading "Navigation Dams had no Effect on Ohio River Flood."

Unsound as the whole Ohio river navigation program is from an economic, and therefore taxpayers' view, we need to limit our discussion to the facts and not allow our emotions to run riot, as is the case with the article in question.

If the 250 million dollars that has been largely thrown away on the Ohio river navigation improvements had been spent for flood control reservoirs, it would have been possible—on the basis of the proven experience of the five flood control reservoirs at Dayton, Ohio—to have secured 6,728,000 acre-feet of storage. The proposed flood control reservoirs above Pittsburgh are to have a storage capacity of 1,944,000 acre-feet.

Four years ago Samuel P. Bush, retired president of the Buckeye Steel Castings Company in this city, and the writer made a recommendation to the in-coming Administration that the Public works program should consist primarily of flood control reservoirs. If the Washington Administration had heeded this advice four years ago, we would not have had a flood this year.

SAMUEL S. WYER

[A. Fletcher Marsh, vice-president of the Marsh & Truman Lumber Co., Chicago, has sent us a propaganda "hand-out" of the Army Engineers in which an attempt is made to belittle the Ohio dams as a flood cause, in the following language:

A statement was released today by the U. S. Division Engineer, Colonel R. G. Powell, branding as totally without foundation the contention made by some laymen and recently given wide publicity that the system of navigation dams on the Ohio river appreciably affected the recent flood. Colonel Powell stated that these dams are of the movable type provided with wickets and that they lie on the bed of the river during the floods and offer no resistance whatever to the flow. Colonel Powell said, "We began to lower these wickets in the present instance about December 10, 1936, and all dams were entirely down by December 23, over one month before the crest of the flood was reached. As there was a secondary rise which passed Cincinnati and Louisville on January 13, any hypothetical effect the small amount of water imponded by the dams may have had on stages of the river would have been completely obliterated during this first small rise. If the Ohio river dams were the cause of the flood, why was the highest stage on record attained on the lower Mississippi river, which has no navigation dams?"

Colonel Powell pointed out that certain interests at Louisville have been especially persistent in claiming that the government dam there contributed materially to the high stages attained during the recent flood. In this connection, he said that this dam is built on the rock which forms the natural falls at this locality, and does not extend straight across the river, as is usual. The arm extending into the river from the Indiana shore reaches only one-third of the way across the river at the head of the falls and is provided with wickets similar to those at other Ohio river dams. The remainder of the dam, or 80 per cent of its total length, extends one and one-fifth miles downstream in the middle of the channel and parallel to the thread of the stream, thus virtually there is no resistance to flow. In the recent flood, coincident readings taken on the upper and lower gages at the dam showed a difference of but two feet in the elevation of the water surface above and below the falls at a stage ten feet below the flood crest. As the lower gage later became submerged, readings at higher stages are not available. However, at the crest of the flood it is estimated that the difference amounted to only a fraction of a foot. This observed drop at the falls is not due to the navigation dam, but is a natural effect which results from the falls over which there is a drop of twenty-six feet at low water.

To which our comment is that the facts may be as stated in the "hand-out"; yet the Army Engineers are not disinterested parties to this controversy—and if and when they begin to knock the activity from which they derive their bread and butter, that will be news.—EDITOR]

Handling Stores in Flood Time

LOUISVILLE, KY.

TO THE EDITOR:

In this letter, the writer has undertaken to answer questions which have been asked regarding the problems and experience of the supply forces of the Louisville & Nashville during the recent flood in the Ohio river valley.

Our main store, particularly for car and locomotive materials, is located at South Louisville, Ky., and inasmuch as Louisville was cut off and isolated for a week to ten days, we were not in position to be of any service to unaffected portions of the railroad. The division storekeeper at Birmingham, Ala., supplied materials for the railroad south of Nashville, Tenn., making numerous special purchases to supply needs. Elsewhere, the stores and material-using departments were left largely to their own resources during the period when they were cut off from their main source of supply at South Louisville.

In Louisville, with the basement of the general office building flooded and with no lights, heat, elevator service, etc., certain major transportation operations were handled from temporary headquarters in office cars adjacent to our South Louisville plant. At our general store, a small group of the principal stores officers and a small, picked group of stockkeepers, helpers, laborers, etc., were on duty approximately 18 hr. each day to get out emergency materials, such as pumps, pipe and fittings, hose, etc., required locally to combat the flood waters, and our several stores department motor trucks handled a very heavy volume of emergency materials. We also dispensed many emergency supplies, such as kerosene, oil lamps, charcoal burners, stoves, etc., not only for strictly railroad purposes but also for people in the general South Louisville area whose homes had been flooded and who were without heat, light, etc. Certain emergency materials were also furnished to the city fire department, official relief agencies, etc.

At our Decoursey, Ky., store, adjacent to Covington, Ky.,

several ground-level material sheds, containing heavy materials, were flooded, but the water did not get into the storage space of the main store building there. Neither did water get into the storage levels of our buildings and material yards at the South Louisville general store, nor at the Howell, Ind., store. At a small storehouse where we carry repair parts for motor cars and signal apparatus, in the downtown Louisville area, water got into the material storage level to the height of 26 in., but all of the materials had been moved to higher shelves and we suffered no loss of stock. The stationery and dining car departments suffered some loss.

Our material losses at stores locations proper were thus comparatively negligible. There were losses of cross ties, timber and other materials in roadway department line stocks on some divisions, but the approximate amount of such losses is, as yet, not definitely known.

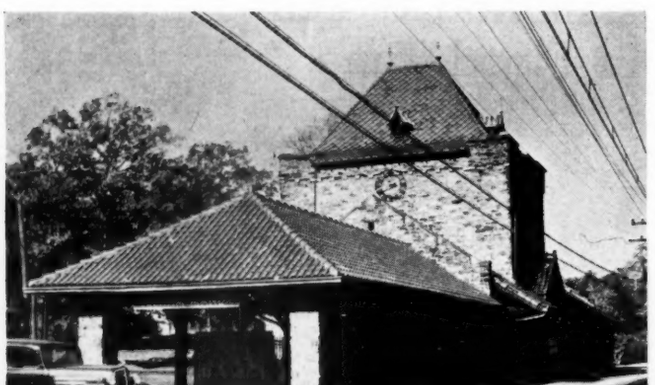
C. H. MURRIN,
General Storekeeper, Louisville & Nashville.

New Haven Gives Model Club a Home

PELHAM MANOR, N. Y.

TO THE EDITOR:

Following up the announcement in the March 6 *Railway Age* regarding the visit of the members and guests of the Westchester Model Club, Inc., to the Baldwin Locomotive Works and the Pennsylvania shops at Wilmington, may I advise that over 170 persons made this trip. The actual membership of our club is less than one-third of this number but when news of the trip reached rail "fans" and enthusiasts, we were swamped with inquiries and requests for tickets. The interest developed in this trip indicates the trend of rail enthusiasts to take advantage of such excursions whenever and wherever possible. The club



New Quarters of Westchester Model Club

is, of course, especially grateful to the officials of Baldwin's and the Pennsylvania for their co-operation and helpful guiding of the party through the shops mentioned.

Possibly of more interest to railroad publicity and public relations men is the fact that, through the courtesy and co-operation of the New Haven, we have been accorded the use of the unused Pelham Manor Station—one of the finest suburban stations in the country. It is doubtful that any similar organization has such excellent headquarters and you can readily imagine the goodwill which the road has gained through its generosity both from members and visitors of the club. Several members now have model New Haven equipment under construction and the frequent guests and visitors are left with the impression that the New Haven is not such a cold-hearted corporation such as most railroads are generally held by the public to be.

Apropos of this, other roads with unused buildings might follow the example, since there are many model clubs looking for adequate quarters. Or model railroad clubs might be started in different localities if the space were available. Local newspapers are nearly always glad to co-operate as long as the venture is non-commercial and thus another field for publicity and goodwill might be developed. Scale model railroading is growing by leaps and bounds (I am speaking of the adult hobby), so the railroads ought to make the most of it.

E. P. ALEXANDER.

Japanese Modernize Railways

KYOTO, JAPAN

TO THE EDITOR:

While traveling over that portion of the Imperial Railways of Japan between Tokyo and Kyoto, on the way to India, I have been greatly impressed with the progress being made. The line from Tokyo to Kobe is 369 miles long, the scheduled time for passenger trains being 8 hr. 37 min.

Part of this line is electrified, and has four tracks—two for freight and two for high-speed passenger trains. Double head freight and passenger trains are common, and there are stretches where the service is supplemented by gasoline-electric coaches, which on the electric section are driven by current from the wires.

The service rendered passengers is novel. At the beginning of a trip they are given four pamphlets written in English so that they may better understand and enjoy the journey. On the time card a.m. figures are printed with blue ink and p.m. with red. The short time at stations is impressive—one minute at Yokohama with over 700,000 people, and one minute at Kyoto, where there were some 60 passengers leaving besides the ones boarding the train. In the face of that, I found it hard to explain why American trains stood so long at stations.

The first-class car on our train had several compartments, to be occupied by more than one, but all sat in the observation end to enjoy the scenery. In one corner was a dwarf tree about 20 in. high and about 20 years old, while in the other was a small tub of growing orchids.

The track was in fine condition, the ballast being of fine stone, not much larger than a walnut. Some old ties, topped off with a 4-in. x 6-in. beam, are used for fences, while others are used as guard fences at dangerous points at the top of embankments or cuts.

The stations are in good condition, and several are entirely new. Station platforms are usually covered the entire length, and are built up to within one step of the car platforms. This in part accounts for the quick loading and unloading of passengers.

Trains are announced through a loud speaker, the sound of which reaches to the platforms so that people changing trains are advised at once. Schedules are also posted on large boards, and in type large enough to be seen quite a distance. Bells are sounded to warn of departure.

Signals are of the latest type used in America, electrically-operated on the main lines. It appeared as if there were extra men guarding the tunnel entrances and exits.

In the second-class coaches, which are clean, the seats are arranged exactly as in our standard day coaches. On a smaller line we found a day coach with long parallel seats stretching from one end of the car to the other, and not comfortable. The toilets in the day coach are the same as in the first-class, with a washstand, hot and cold water, and towels.

Man power is used to switch freight cars in terminals, and about 10 or 12 men can move the cars rapidly after starting. The pinch bar is also used to set a car exactly.

To facilitate the movement of barrows and hand cars over the tracks, approaches are made long to establish an easy grade. Where there is not enough space at right angles, these approaches parallel the railroad tracks until they rise to the level of the crossing.

THOMAS C. POWELL
Retired Chairman of the Board
Chicago & Eastern Illinois

Odds and Ends . . .

Weather Prophet

A. J. Pickthorn, agent for the Southern Pacific at Dunsmuir, Cal., is also the official local weather observer at that point. This past winter, Pickthorn certainly had a lot of weather to observe, what with 181 in. of snow recorded at Dunsmuir between December 26 and February 12.

Conscience Money

The conscience fund of the Pennsylvania for 1936 was unusually large, amounting to over $600. The largest payment was $300, and the smallest 10 cents, the latter from a clergyman in Colorado, who said he had "swiped" two apples from a wrecked Pennsylvania car when he was a boy.

Medalist

W. A. Musick, section laborer for the Missouri-Kansas-Texas, has just been awarded the Navy bronze medal for bravery. The award was made him for the part he played in China 10 years ago, while serving in the Navy, in rescuing a group of British and American missionaries from Chinese bandits.

Altitude Record

The world's highest railway is probably the Antofagasta (Chile) & Bolivia, the Collahuasi branch of which reaches an altitude of 15,809 ft. in Bolivia, while at another point it is 15,705 ft. high. This line climbs the Andes on a 3 per cent grade, terminating at La Paz, Bolivia, at 12,143 ft. The Peruvian Central is a close second with a line which attains an altitude of 15,806 ft.

Purple Hearts

The Order of the Purple Heart was founded by George Washington to honor American soldiers showing exceptional bravery. For nearly a hundred years it was allowed to lapse, so that there are few proud wearers of this decoration. One of them is a railway man, William M. Bill, brakeman for the St. Louis-San Francisco at Pittsburgh, Kan. Bill was awarded the decoration for conspicuous gallantry during the battle of the Somme.

Seeing the Sea

The railways on the American Pacific Coast probably hold the world record for giving their passengers continuous views of the ocean while traveling. On the Coast division of the Southern Pacific, for example, the ocean is in practically continuous view for 100 of the 471 miles between Los Angeles and San Francisco, along the route of the new streamlined "Daylights." The line of the Atchison, Topeka & Santa Fe between Los Angeles and San Diego provides an approximately similar distance of ocean view, both lines being practically on the beach part of the time. Between Kobe and Shimoneseki, on the Japanese Government Railways, the trains follow the coast line of the Inland Sea closely for some 200 miles. However, in this case, the coast is so indented as to require frequent excursions inland, so that the continuous distance in sight of the ocean is materially less than in the case of the Santa Fe or the S. P.

Railway Sheepdogs

Licenses have just been taken out for 25 sheepdogs by the Great Western of England, which employs them to keep the line clear of straying sheep. The sheep descend from the surrounding hills and find their way through the fences onto the railway in search of new pastures. In doing so they not only endanger their own lives, but they may also cause delays and other inconveniences to trains. These sheepdogs not only have to round up the sheep and shepherd them through an obscure opening, but must acquire track sense in addition, and self-preservation from passing trains. The dogs are trained to answer the commands, the whistles and hand-signals of their masters, from a considerable distance. But they do not always wait to be told what to do and often have routed the trespassers long before the section man arrives. They are also trained to know what the warning whistle of an approaching train means. Moreover, they give warning to the section men of an approaching train and will not leave the line until all the men are in the clear. The track sense of these dogs is remarkable. For example, if caught between the tracks while driving a sheep, they will lie down until the two trains have passed. The dogs start their training at an early age, in some cases before they are six months old, and there are today quite a number of old timers who have seven, eight, or even nine years to their credit.

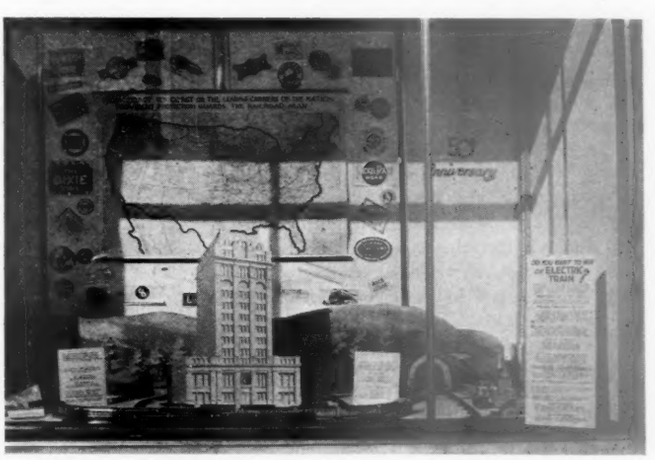
Railway Astronomer

When E. F. McPike, superintendent of perishable freight service for the Illinois Central, is not busy shepherding freezers up and down the line, he spends his time star-gazing. He is quite outstanding in astronomy, as is indicated by his recent receipt of the coveted appointment as a fellow of the Royal Astronomical Society of Great Britain. Mr. McPike, it might be mentioned in passing, is a director or member in the following other societies:

Institute of Transport of London
Oxford Historical Society
World Association for Adult Education
American Association for Adult Education
American Historical Society
American Library Association
American Institute of Refrigeration
American Association for the Advancement of Science
History of Science Society
Illinois State Academy of Science
Illinois State Historical Society
Kentucky Historical Society
Association of Practitioners Before the I.C.C.
American Society of Refrigerating Engineers

Railroad Display

A recent contest fostered by the railroad department of the Provident Life and Accident Insurance Company of Chattanooga, Tenn., featuring a railway window display, attracted considerable attention among railroaders. The display comprised an elaborate model railway lay-out, complete with station buildings and yards, together with a huge railway map of the United States on which the lines served by the Provident were marked in heavy black lines. The idea was to guess the total mileage of the railways so marked, the prizes being model railway trains and railway books. The winner guessed within 111 miles of the correct total of several thousand miles.



Interesting Railway Window Display

NEWS

Ruling Will Speed Ex Parte 115 Case

I. C. C. decides to consider proposed rates on basic commodities separately

On April 9 the Interstate Commerce Commission announced that it had decided to consider the basic commodities involved in Ex Parte 115 as a separate case and that it would render an early decision on this group from which the railroads hope to get in the neighborhood of $70,000,000 in increased revenue. Further hearings on the basic commodities case will be held before Commissioner Aitchison at the Hotel Morrison in Chicago commencing on April 22 with respect to so much of the issues as relate to (1) general aspects of the case, (2) the so-called heavy basic commodity list, comprising the involved rates on (a) coal and coke; iron ore; (b) articles in the iron and steel list; (c) articles in the lime, cement, and plaster list, concerning which testimony has already been received; (d) petroleum and its products, asphalt and road oil, tar and pitch, benzol, liquefied petroleum gas and lignin liquor and lignin pitch; and also (3) the relation of fifth and sixth classes to first class rates in official territory. For the purpose of bringing the record down to date before submission to the commission, the proceeding is set for further hearing before Commissioner Aitchison at the offices of the commission in Washington, D. C. on June 14. Briefs may be served and filed not later than June 5.

The net effect of this ruling is that the railroads will get a decision sometime in the summer on the proposed increases on this large list of basic commodities without waiting for the completion of testimony on the whole case which would most likely result in a decision sometime in the Spring of 1938. Testimony on the remainder of the commodities involved in the case will be heard after the completion of the basic commodities case.

In the meantime the railroads are in a position to receive an estimated $8,000,000 increase on a long list of miscellaneous articles on which they have filed regular tariffs and which are now pending before the commission. These articles were withdrawn from the regular rate case when it was discovered that increases could be asked for without exceeding the maximum set by the commission in previous cases. The commission will vote upon these proposed increases about April 20, and they will go into effect if the commission does not vote to suspend them. A similar group went into effect on March 20.

The commission has also announced a series of three additional hearings in the West in regard to transcontinental-mountain-pacific rates, changes in which are contemplated in the carriers' general proposals. Besides the hearing which has already been set at San Francisco on April 12, Commissioner Aitchison will hold hearings at Salt Lake City on May 20; at Los Angeles, Calif., on May 24 and at Portland, Oregon, on June 2.

House Passes Pettengill Bill

The Pettengill bill amending the long-and-short-haul clause of the fourth section of the Interstate Commerce Act was passed by the House of Representatives on April 14 by a vote of 268 to 120. The bill came to a vote on the regular calendar, without any rule to give it preference. Opponents of the measure raised every possible objection in the effort to block passage, leaders among the opposition being Representatives Bulwinkle of North Carolina, Chapman of Kentucky, Cole of Maryland, Holmes of Massachusetts, Gearhart of California, Murdock of Arizona, Luckey of Nebraska, White of Idaho, Colden of California, Hill of Washington, Sadowski of Michigan and Culkin of New York. The measure was, however, ably defended among others by Chairman Lea of the Interstate Commerce Committee, Representatives Pettengill of Indiana, Martin of Colorado, Mapes of Michigan, Wolverton of New Jersey, Wadsworth of New York, and Withrow of Wisconsin.

C. & E. I. to Speed Chicago-St. Louis Service

The Chicago & Eastern Illinois on April 25 will rename its "Century of Progress," operating between Chicago and St. Louis, Missouri, the "Zipper" and reduce the running time of the southbound train 30 min. Under the new schedule the train will leave Chicago at 12 noon and arrive in St. Louis at 5 p.m., while returning it will leave St. Louis at 12:32 p.m. and arrive in Chicago at 5:32 as at present. On April 29 it will change the name of the "Spirit of Progress" to the "Silent Night."

Agreement Near on Pension Plan

Senator Harrison says that Congress will "go ahead" with legislation

Senator Harrison, chairman of the senate finance committee, announced on April 13 that Congress would "go ahead" in drafting legislation to enact into law the agreement between the railroads and the rail brotherhoods on the subject of pensions. He said that the bill would be introduced despite the fact that an agreement has not been reached to date by the railroad management and labor representatives and the Treasury department, which is objecting to the insufficiency of revenue which it feels would result from the tax provided in the plan. In view of Senator Harrison's announcement and the statement of President Roosevelt at his press conference on April 13 that he felt that the parties had just about reached an agreement, it appears that the Treasury and the railroad operators and labor are near to an agreement.

On April 13 Secretary Morgenthau met Senator Harrison; Chairman Doughton of the House Ways and Means Committee; J. J. Pelley of the Association of American Railroads; George Harrison, head of the Railroad Labor Executives; Murray W. Lattimer, chairman of the Railroad Retirement Board, and government actuaries. The actuaries had been asked to make a report on the actuarial soundness of the proposals in the pension agreement. They proposed two alternatives—a flat 7 per cent rate, 3½ per cent on both employers and employees, and a rate graduated from 5 to 9 per cent, with a periodic study to determine whether or not there should be any change in raising or lowering the rates. Senator Harrison said that "the Treasury is willing to go along on any satisfactory proposal made by the actuaries."

Secretary Morgenthau is understood to be satisfied with the 7 per cent rate, but the railroads are contending for a 5 per cent tax. The Treasury does not believe that the 5 per cent levy will be high enough to raise sufficient funds to carry the plan and that in the end the government will be forced to make up the deficit. Mr. Morgenthau is also contending that the railroads should pay the Treasury the $134,000,000 now tied up in litigation in order that the plan would have something to start off with.

Fan Trip to Alco Shops a "Sellout"

New York Central's "Third Wonder Trip" brings out 3,000 enthusiasts

In commemoration of the ninetieth anniversaries of both the American Locomotive Company and the Hudson River Railroad (a predecessor of the New York Central), over 3,000 persons from New York, Upper New York State and Boston, Mass., journeyed last Sunday to the Schenectady plant of the locomotive company over the tracks of the New York Central and its subsidiary, the Boston & Albany. A special feature of this, the third "wonder trip" to be conducted by the Central, was the presence of F. E. Williamson, president of the road, and W. C. Dickerman, president of the American Locomotive Company, as members of the party and guides for the inspection trip. R. H. Allison, manager of the plant, welcomed the visitors.

The tour, which was carried through by the combined efforts of the Railway & Locomotive Historical Society, New York Chapter; Railroad Enthusiasts, Inc., New England division; Railroad Stories Magazine; the New York Central; and their host, the American Locomotive Company, enabled railroad hobbyists to experience the excitement of main-line rail travel and inspect at first hand the construction of modern motive power. On their own initiative, the "fans" supplemented these ac-

(*Continued on page 694*)

Morgan Studios

F. E. Williamson, W. C. Dickerman, and R. H. Allison—Just Part of the Crowd

A Section of Enthusiasts Descend on the Plant

Railways Advance Despite Handicaps

But Dunn predicts a halt if unwarranted rise in costs comes from legislation

"The railways are going forward with a great program of rehabilitation and improvement in spite of handicaps imposed mainly by government that spokesmen of many other industries are contending would undermine their solvency and arrest their progress," said Samuel O. Dunn, chairman of the Simmons-Boardman Publishing Corporation and editor of *Railway Age*, in an address on April 13 before the Central Railway Club in Buffalo, N. Y. "In the worst depression years 1932 and 1933 their annual expenditures for equipment and materials averaged only $272,000,000. In 1936 they were $761,000,000, or almost three times as large. In the first quarter of this year they placed orders for 50 per cent more locomotives than in the first quarter of last year, for three times as many freight cars and for five times as many passenger train cars.

"These large increases in their purchases from the manufacturing industry are due to both need and opportunity. They need more and better facilities to handle increasing traffic and render improved service. They are being afforded opportunity to provide them by current and prospective increases in their net operating income and consequent improvement in their credit.

"But they must go a long way yet before they complete their recovery. Their equipment and facilities declined and deteriorated so much during the depression years that the increase of their traffic during the last two years virtually exhausted their surpluses of really serviceable freight and passenger equipment. They had small but real freight car shortages in the fall of 1936. If their traffic continues to increase, as apparently it will, only more rapid additions to their facilities will enable them to enlarge and improve their service enough to satisfy public demands. Even in 1936 their purchases of equipment and materials were only about one-half as large as in pre-depression years.

"The railways have less reason than any other industry for concern regarding the struggle over the 'reform' or 'packing' of the Supreme Court. The reason is that, regardless of constitutional theories, the Court has not prevented, and perhaps could not prevent, application to them of policies of regulation and government-aided competition which have virtually left them at the mercy of Congress and its agencies. Even their supposed constitutional right to regulation that would not be confiscatory has in practice been disregarded. The Interstate Commerce Commission in 1922 held they were constitutionally entitled to 5¾ per cent. In the subsequent fifteen years of prosperity and depression they have averaged only 3⅓ per cent. This experience shows their future will be deter-

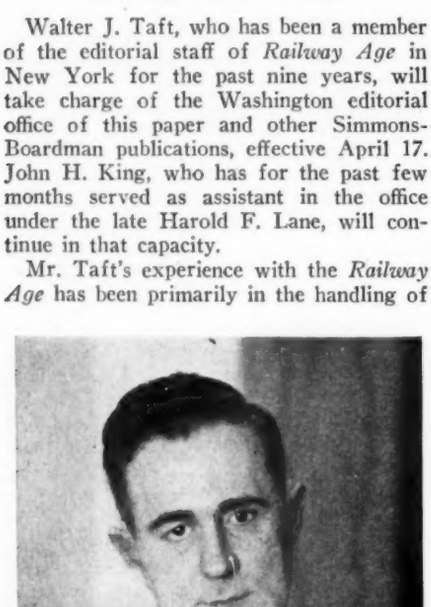
(*Continued on page 694*)

W. J. Taft Heads Washington Office

Railway Age assigns broadly experienced editor to post of late H. F. Lane

Walter J. Taft, who has been a member of the editorial staff of *Railway Age* in New York for the past nine years, will take charge of the Washington editorial office of this paper and other Simmons-Boardman publications, effective April 17. John H. King, who has for the past few months served as assistant in the office under the late Harold F. Lane, will continue in that capacity.

Mr. Taft's experience with the *Railway Age* has been primarily in the handling of



Walter J. Taft

general news assignments—both from an editorial and reportorial standpoint. Commission cases which have been heard in New York he has "covered" and is thoroughly familiar with the background essential to intelligent interpretation of all happenings involving the relationship between the railways and the government, whether legislative or regulatory. His experience has also included the handling of motor transport developments, and controversies which have arisen between the railroads and competing forms of transportation. He is, moreover, thoroughly familiar with the literature on all aspects of railroads—rate questions, regulation and labor matters in particular—and has for several years been the principal author of book reviews on such topics which have appeared in the *Railway Age*.

Mr. Taft came to the *Railway Age* in April, 1928, having already had both railroad and newspaper experience. Born on July 29, 1902, at Glendale, R. I., he attended public school at Pascoag, R. I., and the LaSalle Academy at Providence. He received his A.B. degree from Providence College in 1924. In 1924-25 he was a reporter for the Providence Evening Tribune. In 1925-27 he attended the Harvard Business School (taking Professor Cunningham's courses in railroad transportation), from which institution he was graduated in the latter year with the degree of Master of Business Administration. In the summer of 1926, Mr. Taft worked in the accounting office of the New Haven at Harlem river, New York. From July to December, 1927, he was a clerk in the engineering department of the Bangor & Aroostook at Houlton, Me. From January to April, 1928, he was a statistician in the service of the Boston & Maine at Boston, which position he left to join the staff of *Railway Age*.

4,000 Days Without an Accident

Four thousand days without a reportable accident is a record just completed by machine shop employees of the Louisville & Nashville at Corbin, Ky. The accomplishment was celebrated with a banquet.

Status of Rail Loans to R.F.C.

The Reconstruction Finance Corporation has announced that as of March 31 it had disbursed to the railroads the sum of $517,126,239 and had received repayments totaling $176,759,016.

Safety Congress to be Held at Kansas City

The 26th National Safety Congress and Exposition of the National Safety Council, Inc., will be held at Kansas City, Mo., on October 11 to 15.

A.R.E.E. Meeting

The Association of Railway Electrical Engineers will hold its semi-annual meeting at the Chelsea Hotel, Atlantic City, N. J., on June 17, 1937. Progress reports of the committees will be published in the June issue of Railway Electrical Engineer.

I.C.C. Postpones Bus Order

The Interstate Commerce Commission, Division 5, has extended to June 15 the date by which contract motor carriers must comply with the commission's order requiring the filing of all contracts to be kept open for public inspection.

Air Brake Association to Meet At Atlantic City

The Air Brake Association has just announced that it will hold a two-day business meeting at Haddon Hall, Atlantic City, June 17-18. This will be at the time of the meeting of the Mechanical Division and will enable the members of the Air Brake Association to take advantage of the big exhibit in the Auditorium.

I. C. Building Damaged by Fire

A wooden building connected with the Illinois Central suburban station at Randolph street and Michigan avenue, Chicago, was severely damaged by fire on March 10, the estimated loss being $10,000. The structure was built about seven years ago to serve as a temporary station during the construction of the present suburban station, and has been used by the Chicago, South Shore & South Bend as a station and for locker rooms and office space.

Howe's C.N.R. Bill Accepted by Senate

Amendment providing for showing road's debt to government is killed

Another big railway fight of the parliamentary session at Ottawa came this week on Minister of Transport Howe's bill to recast the financial structure of the Canadian National. The controversy ended near the close of the session with the Senate finally bowing to the insistent demand of the government that the measure not provide for insertion in the balance sheet of the railway the sum of about $1,300,000,000, representing the road's debt to the government and carried as a proprietor's equity in the new set-up. Conservatives in the House led by R. B. Bennett and in the Senate by Senator Arthur Meighen were demanding that what the people had invested in the road should be clearly and continuously shown in the road's balance sheet, while Mr. Howe said such a change would have the effect, so far as the government was concerned, of killing the bill.

Mr. Howe stressed two reasons for rejecting the proposed amendment. "One," he said, "is that the figure named is grossly inaccurate; it is not the correct debt at all. The second is that to put in there any such specific sum of that magnitude, however one cares to make it up, is to undo what this bill undertakes to do.

"In that connection it is interesting to note that it has been said here that financial centres were quite aware of this duplication. My attention has been called to the statement filed by the underwriters in connection with the recent loan by the Dominion in the United States. The underwriters, Morgan, Stanley & Company, found it necessary in a registration statement issued on January 14, 1937, under the United States security act of 1933, to caution prospective investors against a misconception of the present combined debt position of the Dominion and its railways.

"My officers who are responsible for these matters tell me that, if we put the proposed footnote on the balance sheet, in order to float a loan in the United States it would be necessary to have another explanation. What we are trying to do is to present to the world a combined statement of the debt of the Dominion and the debt of the railways so that the two can be added together and the total liabilities of Canada and its railways disclosed. Unless we can do that there is no purpose in this bill."

Mr. Bennett observed that "the difference between the Senate and the minister is the difference between those who desire to disclose the situation and those who desire to cover it up. That is the story. We may talk about it for the rest of the week, but that is the fact."

To which Mr. Howe replied, "We want to disclose it, but at the same time we do not want to magnify it."

In the Senate Mr. Meighen objected to

that body's having addressed to it "such utter nonsense as in that message," although he "should not mind the Commons' rejection of our amendment if they would give us a reason that is true." He added that "to tell us that that restores to the balance sheet a certain sum which is being written off is an affront. We know it does not, and they know it does not.

"I feel disposed to meet the leader of the Government in this matter, although I have still not the slightest doubt as to the merits of our stand. In fact we yielded, yielded, yielded right along. Because we insist on the people knowing the facts, so as to try to bring their psychology to a realization that we cannot continue going into debt forever we are accused of being enemies of the Canadian National Railways. I have heard this accusation for many years. I suffered from it all the time I was leader of the Conservative party. Although at a cost of not less than 50 seats in this Dominion I was the main actor in the drama that brought about ownership of the National Railways by the country, men who then pointed their finger at me as the rascal author of the program now hold me up as the enemy of the National System. I do not know how anything could be more preposterous. The story commenced in 1921. One man was the principal in the whole program of disseminating that story through the Dominion. He is the same man who was mainly responsible for the $100,000,000 of added debt through nine years of revel. He was the head of the forces marching through all that debacle."

Asked if the man referred to were a member of Parliament, Mr. Meighen replied in the negative, adding: "To be very frank, I refer to Sir Henry Thornton. He is the man who disseminated that story and thus was responsible for the alignment of that entire railway vote almost to a man. Now we hear the charge again. If you seek, even by a footnote, to let the people know that this road financially is not being made a success, that it is going into debt at a ghastly rate—if you do not, indeed enter into a conspiracy with others to conceal it from them, you are the enemy of the Canadian National Railways.

"With those remarks I am going to accede to the position of the Government. I hope I may speak for all here when I say I do not insist on our amendment in its original form."

Hon. Raoul Dandurand, government leader in the Senate, expressed his appreciation of the opposition leader's stand, continuing to voice the thought that "the main difference between us has nothing to do with the bill. What is in his mind, as in the minds of us all, is the question, what can we all do, collectively or individually, towards improving the financial situation of our railway system. Unfortunately we have not, legislatively, made very great advance towards improving the situation. In the solution of a problem of such importance and intricacy as this, the only men upon whom we can rely are the ones who have been and still are striving to bring about a remedy; and they are to be found in the two branches of Parliament. I have yet to hear of any constructive policy from outside which has been reflected in the attitude of the House of Commons or the Senate of Canada. It does not matter what kind of balance sheet we present, for nine-tenths of the people of Canada do not understand a balance sheet. So in reality the responsibility is upon us."

After further debate the Conservative majority in the Senate capitulated.

Torian Appointed to Adjustment Board

John G. Torian, assistant general manager of the Southern Pacific Lines in Texas and Louisiana at Houston, Texas, has been appointed a member of Division 3 of the National Railway Adjustment Board with headquarters at Chicago.

Railroad Credit Corporation Announces Dividend

E. G. Buckland, president of the Railroad Credit Corporation, has announced that the Railroad Credit Corporation will make a liquidating distribution of one per cent on April 30, 1937, amounting to $735,407. Of this amount $522,394 will be paid in cash and $213,013 will be credited on carriers' indebtedness to the corporation. This will bring the total amount distributed to $52,213,903, or 71 per cent of the fund originally contributed by the carriers participating in the marshalling and distributing plan, 1931. Of this total $25,728,124 will have been returned in cash and $26,485,779 in credits.

May Safety Poster

The investigation of accidents to find their causes is the keynote of the safety poster of the Association of American Railroads for May. Addressed to officers and employees, the circular supplement pleads for honesty and thoroughness in accident hearings, stressing that only by such efforts can the causes of accidents be eliminated.

Briefly, the poster depicts a hand pushing back the black background upon which are spread in white the eight general causes of accidents: Negligence, Thoughtlessness, Poor Supervision, Poor Team Work, Wrong Methods, Keeping Bad Hours, Disobedience, Worry-Hurry. The caption above reads: "Push accident causes off your railroad."

Railroad Employment Increased 7.9 Per Cent in March

Class I railroads reported to the Interstate Commerce Commission as of the middle of March a total of 1,101,703 employees, an increase of 7.9 per cent compared with the number in March, 1936, and an increase of 0.53 per cent compared with that in February. The number in maintenance of way and structures service increased 9.32 per cent over the number in the corresponding month of last year, and the number in maintenance of equipment and stores increased 9.1 per cent over the corresponding month of last year. With adjustment for seasonal variations, the commission's Bureau of Statistics calculates that the March employment was 63.5 per cent of that for the period of 1923-1925.

Burlington Completes Streamlined Steam Locomotive

The first of two streamlined steam locomotives, in which reciprocating parts are designed to meet the demands of high speed operation, has just been completed in the West Burlington, Iowa, shops of the Chicago, Burlington & Quincy, and, after a series of road tests, will be placed in regular service as a relief locomotive on the Zephyr runs between Chicago and Denver, Colo., between Chicago and the Twin Cities, and in other high speed passenger service. At ceremonies held at the shops on April 11 and attended by 5,000 people, the first locomotive was christened "Aeolus." The name, submitted by Mrs. Goldie Murray of Burlington in a contest conducted by the Burlington Junior Chamber of Commerce, and taken from Greek

Burlington's Streamlined Steam Locomotive Was Christened Aeolus at Its West Burlington, Ia., Shops on April 11

Mythology, means "keeper of the winds." The stainless-steel sheets which encase the locomotive and tender give the locomotive an appearance similar to that of the Zephyrs. The Aeolus, a 4-6-4 type locomotive, burns coal and is capable of speeds of more than 100 miles an hour. Because of the design of reciprocating parts, the destructive effect on the track will be less than that of conventional locomotives operating at high speeds.

P.R.R. Plans 17¼-Hr. N. Y.-Chicago Train with No Extra Fare

On April 25 the Pennsylvania will inaugurate in both directions between New York, Philadelphia and Chicago a new fast train with a running time second only to that of the Broadway Limited, and with no extra fare. The new train, called "The General," will have a New York-Chicago schedule of 17¼ hours., while the Philadelphia, Pa.,-Chicago run will be covered in 15¾ hrs. The westbound "General" will leave New York at 4:40 p.m. and North Philadelphia at 6:09 p.m. eastern daylight time, arriving at Chicago at 8:05 a.m. central daylight time. Eastbound, the Chicago leaving time will be 4:05 p.m., with arrival at North Philadelphia at 8:52 a.m. and New York at 10:20 a.m.

Roosevelt "Forgot" I.C.C. Appointments

At his press conference on April 9 a newsman asked President Roosevelt what action he had taken on the appointments of the two Interstate Commerce Commissioners who must be named to fill the positions now held by Commissioners Tate and Eastman who are serving on hold-over appointments. He told the correspondent that he was glad that he had reminded him of the situation as he had been so busy that he had completely forgotten it. He did not indicate how soon he would make his choices for the positions. Commissioners Tate and Eastman may continue to serve indefinitely under legislation passed a couple of years ago which provides that if the President does not appoint a successor, the incumbent may continue to serve.

Labor Bills To Be Discussed in Conference

Committees representing the Railway Labor Executives' Association and the Association of American Railroads have arranged to consider in conference three of organized railroad labor's bills which are now pending in Congress in an effort to work out the issues without having to resort to legislation. The bills which will be discussed are those providing for greater power for the Interstate Commerce Commission in dealing with the problems of train-dispatching offices, inspection of tracks and bridges, and installation of signal systems. The 6 hour day bill and the "full crew" bill are not included in the list of bills to be considered. During the present session there has been no action regarding these two bills, but there has been action by both houses in committee on the three bills to be considered. The question of unemployment insurance may also be discussed during the conferences. Organized railroad labor is on record as favoring a system of unemployment insurance for its employees which is separate and distinct from and in place of the system now provided by the social security act.

To Study Traffic Problems of North Atlantic Ports

A committee of 20 steamship and railway executives has been organized by Edward J. Karr, traffic manager of the Calmar Steamship Company, to study the traffic problems of North Atlantic ports in the United States. Authorized by a recent conference of transportation executives in New York, the committee will discuss ways and means to meet the diversion of goods to other than North Atlantic ports.

The railway officers on the committee are: Howard Albright, foreign freight agent of the Reading; Alfred J. Ball, foreign freight traffic manager of the Pennsylvania; J. F. Brady, foreign freight agent of the New York Central; W. H. Browne, foreign freight agent of the Delaware, Lackawanna & Western; W. S. Burton, foreign freight traffic manager of the Western Maryland; F. J. Couse, foreign freight traffic manager of the Baltimore & Ohio; R. C. Creager, foreign freight agent of the Chesapeake & Ohio; W. D. Dimmitt, general foreign freight agent of the Norfolk & Western; A. F. Lane, general agent of marine traffic of the Boston & Maine; and T. E. McAndrews, foreign freight traffic manager of the Erie.

Ball Stock Given to Charity Trust

George A. Ball, on April 8, gave his entire holdings in the Midamerica Corporation, which controls the railroad system built by the late Van Swerigen brothers, to the George and Frances Ball Foundation. The foundation was incorporated on March 22 with the secretary of state at Indianapolis, Ind., incorporators being: Mr. Ball; his wife, Frances Ball; their daughter, Elizabeth W. Ball; Leland Rex Robinson, Bronxville, N. Y.; and Dr. Lemuel A. Pittenger, president of the Ball State Teachers College. All the incorporators are members of the first board. Mr. Ball and his wife and daughter were designated as life members of the foundation, while Mr. Robinson was named for a two-year term on the board and Dr. Pittenger for three years. The purposes of the foundation are religious, educational and charitable.

Club Meetings

An address entitled "What Must the Railways Provide?" by L. K. Sillcox, first vice-president of the New York Air Brake Company, will feature the next meeting of the Toronto Railway Club on May 17 at Toronto. A musical program will follow the address.

The Railway Club of Pittsburgh at its next meeting on April 22 at the Fort Pitt Hotel, Pittsburgh, Pa., will present as its guest speaker Charles Kerr, Jr., railway engineering department, Westinghouse Electric & Manufacturing Company, who will speak on the subject "Railroad Electrification."

A banquet and entertainment will bring together the New England Railroad Club on May 11 at the Copley-Plaza Hotel, Boston, Mass.

April 19 will be Purchases and Stores Night at the monthly meeting of the Western Railway Club. G. O. Beale, chief purchasing and stores officer of the Chesapeake & Ohio, will be the principal speaker.

Lehigh Valley Featured by R. & L. Bulletin

The Lehigh Valley is featured in Bulletin No. 42, issued February, 1937, by the Railway & Locomotive Historical Society, Boston, Mass. The 64-page booklet contains a detailed historical account of the road's origin, growth and development. Stressing the expansion of corporate structure and physical properties, the article traces the system's development from the authorization of the Delaware, Lehigh, Schuylkill & Susquehanna Railroad Company in 1846 to the inauguration of the now famous "Black-Diamond" run in 1896.

Full accounts of original properties and rolling-stock of systems later absorbed by the parent company also appear. Of special interest to "engine fans" will be the 13-page roster of Lehigh Valley locomotives, including builders' names, wheel-arrangements, cylinder measurements, and diameters of drivers. This is supplemented by a paper concerning motive power development on the road, covering a period of 100 years, presented to the Society on November 13, 1936, by B. C. Bertram, a special engineer of the Lehigh Valley.

Photographs of older motive-power of the system and an index covering the Society's bulletins 31 through 42 complete the issue.

Set April 16 for Strike on S. P. and Northwestern Pacific

A strike of members of the Brotherhood of Locomotive Firemen and Enginemen and the Brotherhood of Railroad Trainmen on the Southern Pacific and the Northwestern Pacific has been set for April 16 following a controversy involving jurisdiction between these brotherhoods and the Brotherhood of Locomotive Engineers and the Order of Railway Conductors. Although the company has received strike notices it does not expect a strike. President Roosevelt on April 14 created a three-man board to investigate the controversy when the National Mediation Board reported that the dispute "now threatens substantially to interrupt interstate commerce."

Those appointed are: Dexter Keezer, president of Reed College, Portland, Ore., Charles Kerr, Washington, D. C., an attorney, and C. Stanleigh Arnold, San Francisco, Calif., an attorney. The board will make its report within 30 days.

The controversial questions at issue have arisen primarily out of the failure of the four train service organizations to agree among themselves upon certain jurisdic-

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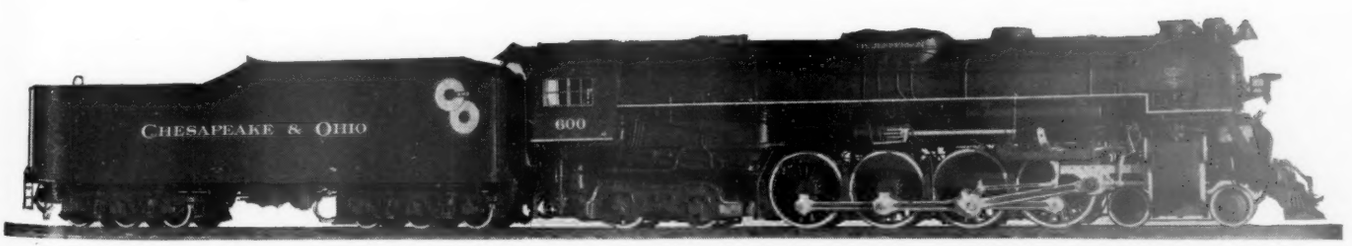
LOCOMOTIVE DESIGN

has greatly improved . . .

"THE average tractive effort of locomotives built within the last decade exceeds the average of those in service at its beginning by nearly 40 per cent."

Professor Edward C. Schmidt
April Scientific American

Due to improvements in design, modern locomotives are available that are capable of delivering 25 to 40 per cent increase in horsepower capacity and without increase in driving wheel load as compared with locomotives ten years old or older.



LIMA LOCOMOTIVE WORKS, LIMA LOCOMOTIVE WORKS INCORPORATED INCORPORATED, LIMA, OHIO

tional matters, namely the method of securing interpretations as to the intent of certain rules in each other's agreements. There is no real dispute between the railroads and the brotherhoods with respect to existing agreements. The railroad therefore is caught between two contending forces and cannot satisfy both and the matter cannot be settled except through operation of the provisions of the Railway Labor Act.

On January 28 the National Mediation Board assumed jurisdiction of the controversy and when mediation failed requested the parties to submit the controversy to arbitration. The four brotherhoods refused, whereupon the company advised the brotherhoods that it would accept any reasonable plan for handling the matters involved that may be satisfactory to the organizations and at the same time advised the board that it is willing to have the matter disposed of through arbitration.

New York Board of Trade Opposes "Make-Work" Bills

The New York Board of Trade, in adopting the report of its committee on railroad transportation, has gone on record as opposing the so-called "make-work" bills now in Congress and has drawn up the following resolution:

Be It Resolved, that the New York Board of Trade reiterates its opposition to the passage of legislation that would materially increase the cost of maintenance and operation of the railroads of this country, and

Be It Further Resolved, that the New York Board of Trade opposes the passage of the following bills to wit:—Government Track Inspection, Government Signal Inspection, Hours of Service Limits, Full Crew Bill, Train Length Bill, Six Hour Day Bill; and

Be It Further Resolved, that this opinion be forwarded to the President of the United States, the members of the Interstate Commerce Commission, the Majority and Minority Leaders of both Houses of Congress, and to the Senators and Congressmen from the State of New York.

Class I Operating Revenue Up 22 Per Cent

Preliminary reports from 94 Class I railroads, representing 82.8 per cent of total operating revenues just received by the Association of American Railroads, show that those railroads, in March, 1937, had estimated operating revenues amounting to $311,356,969 compared with $255,188,710 in the same month of 1936 and $373,310,257 in the same month in 1930. Operating revenues of those roads in March, 1937, were 22 per cent above those for March, 1936, but 16.6 per cent below March, 1930. Freight revenues of the 94 Class I railroads in March, 1937, amounted to $260,943,051, compared with $208,230,557 in March, 1936, and $287,915,513 in March, 1930. Freight revenues in March, 1937, were 25.3 per cent above the same month of 1936, but 9.4 per cent below the same month in 1930. Passenger revenues, in March, 1937, according to these preliminary reports from 94 Class I railroads, totaled $28,638,982, compared with $24,980,500 in March, 1936, and $51,153,023 in March, 1930. For the month of March, 1937, they were 14.6 per cent above the same month of 1936, but 44 per cent below the same month in 1930.

A.S.M.E. Semi-Annual Meeting

The program for the semi-annual meeting of the American Society of Mechanical Engineers to be held at the Hotel Statler, Detroit, Mich., May 17 to 21, as revised since the publication of the tentative plans in the March 20 issue of the *Railway Age,* is as follows:

Tuesday Morning, May 18

Modern Locomotive and Axle Testing Equipment, by T. V. Buckwalter, vice-president; W. C. Sanders, general manager, Railway Division, and O. J. Horger, research engineer, Timken Roller Bearing Co., Canton, Ohio.

Wednesday Morning, May 19

The Aspects of Automotive Engineering Which Have Been Applicable to Railroading, by Edward G. Budd, president, Edward G. Budd Manufacturing Company, Philadelphia, Pa.

The Economics of Power for Light-Weight Trains, by Dr. Rupen Eksergian, Edward G. Budd Manufacturing Company, Philadelphia, Pa.

Wednesday Afternoon, May 19

(Welding Session Co-sponsored by American Welding Society)

Welded Steel in High-Speed Railway Service, by Everett Chapman, president, Lukenweld, Inc., Coatesville, Pa.

Hydromatic Welding of Frames, by C. L. Eksergian, chief engineer, Budd Wheel Co., Philadelphia, Pa.

Thursday Afternoon, May 20

High-Speed Diesel-Engine Maintenance Practice on the Canadian National Railways, by I. I. Sylvester, special engineer, Canadian National Railways, Montreal.

New Urban Transportation Equipment and New Steam Railroad Equipment, by H. L. Andrews, General Electric Company.

Thursday Evening, May 20

Awarding of honorary membership in A.S.M.E. to Dr. Alex Dow, a past president of the society.

Friday Morning, May 21

Railroad Streamlining, by A. I. Lipetz, chief consulting engineer, American Locomotive Company, Schenectady, N. Y.

Light-Weight Passenger Train Resistance, by A. I. Totten, Transportation Engineering Department, General Electric Company.

New York Travel Increases

Trunk line railroads, ferries, and the Hudson & Manhattan carried into and out of New York in 1936 an increase of 15,388,451 passengers, or 5.7 per cent, above the number carried in 1935, the New York Transit Commission has reported in its annual compilation. An increase in commuter travel for 1936 of 4,920,092 over 1935, or 2.3 per cent, is also shown in the report.

During 1936, 286,975,746 passengers were carried into and out of New York City on railroads and ferries, as compared with 271,587,295 in 1935. Trunk line railroads showed an increase from 185,353,718 passengers in 1935 to 198,151,642 in 1936, a gain of 12,797,924. Passengers carried on the Hudson & Manhattan lines showed an increase from 73,994,971 in 1935 to 76,477,943 last year.

Of the 286,975,746 passengers entering and leaving the city last year, 217,976,370 were commuters. Since these represent two-way traffic, the actual number of persons entering the city by railroad and ferry routes was 143,487,873, of whom 108,988,185 were commuters. Estimated on the basis of 300 full traffic days, 478,293 passengers used railroads and ferries into New York City daily, of whom 363,294 were commuters. This gives an estimate number of daily visitors to the city of 114,999. In 1935 the estimated total number of daily passengers was 452,645, of whom 355,094 were commuters and 97,551 daily visitors.

All trunk lines, with the exception of the New York, Westchester & Boston, showed an increase last year over 1935 in combined passenger traffic at the New York gateway, led by the New York, Ontario & Western with a 33 per cent rise.

The following table gives a comparison of the total traffic on the different trunk line railroads in and out of New York City for the years 1936 and 1935.

	1935	1936	Per Cent Increase
B. & O.	344,049	395,190	14.9
C. of N. J.	12,600,492	13,250,720	5.2
Del., L. & W.	16,208,319	16,957,382	4.6
Erie	17,201,507	17,657,159	2.6
Leh. V.	501,876	566,691	12.9
L. I.	64,150,627	68,882,688	7.4
N. Y. C.	28,325,744	29,534,354	4.3
N. Y., N. H. & H.	12,481,970	15,093,266	20.9
N. Y., Ont. & W.	157,023	209,031	33.0
N. Y., W. & B.	7,811,330	7,235,053	7.4D
P. R. R.	25,570,781	28,370,108	10.9
	185,353,718	198,151,642	6.9

Brace-Rod and Ladder Held Not an Unsafe Appliance

A brakeman on the Atchison, Topeka & Santa Fe brought an action against that railroad under the federal Safety Appliance Act for damages for a personal injury resulting from alleged violation of the act. While descending from a box car by a ladder attached to the side of the car, the plaintiff's foot slipped on a round brace rod also attached to the side of the car behind the ladder and fell to the ground, sustaining the injuries for which he sued.

At the trial the plaintiff put his case wholly on violation of the act in that the brace rod and the ladder combined to constitute an unsafe appliance. Judgment against the company resulted, which was affirmed on appeal by the California Supreme Court. The case came before the United States Supreme Court on certiorari. That court last week reversed the judgment on the grounds stated by the court substantially as follows: The ladder itself was not defective. In its structure it complied with the regulations of the Interstate Commerce Commission, "United States Safety-Appliance Standards," order of March 13, 1911. One of these prescribes "Minimum clearance of treads two, preferably 2½ inches." The round brace rods with which the car was equipped extended outward from the wall of the car more than an inch. They operated to strengthen the walk of the car, and were no doubt necessary for that purpose. The brace rod in question ran down the side of the car at an angle of about 45 degrees. The ladder overlay the brace rod and cleared its outermost surface by more than the prescribed 2½ inches. Plaintiff's contention was that the brace rod is a part of the ladder, and by reason of its slant and rounded shape made the descent of the ladder insecure.

The Supreme Court said that the evi-

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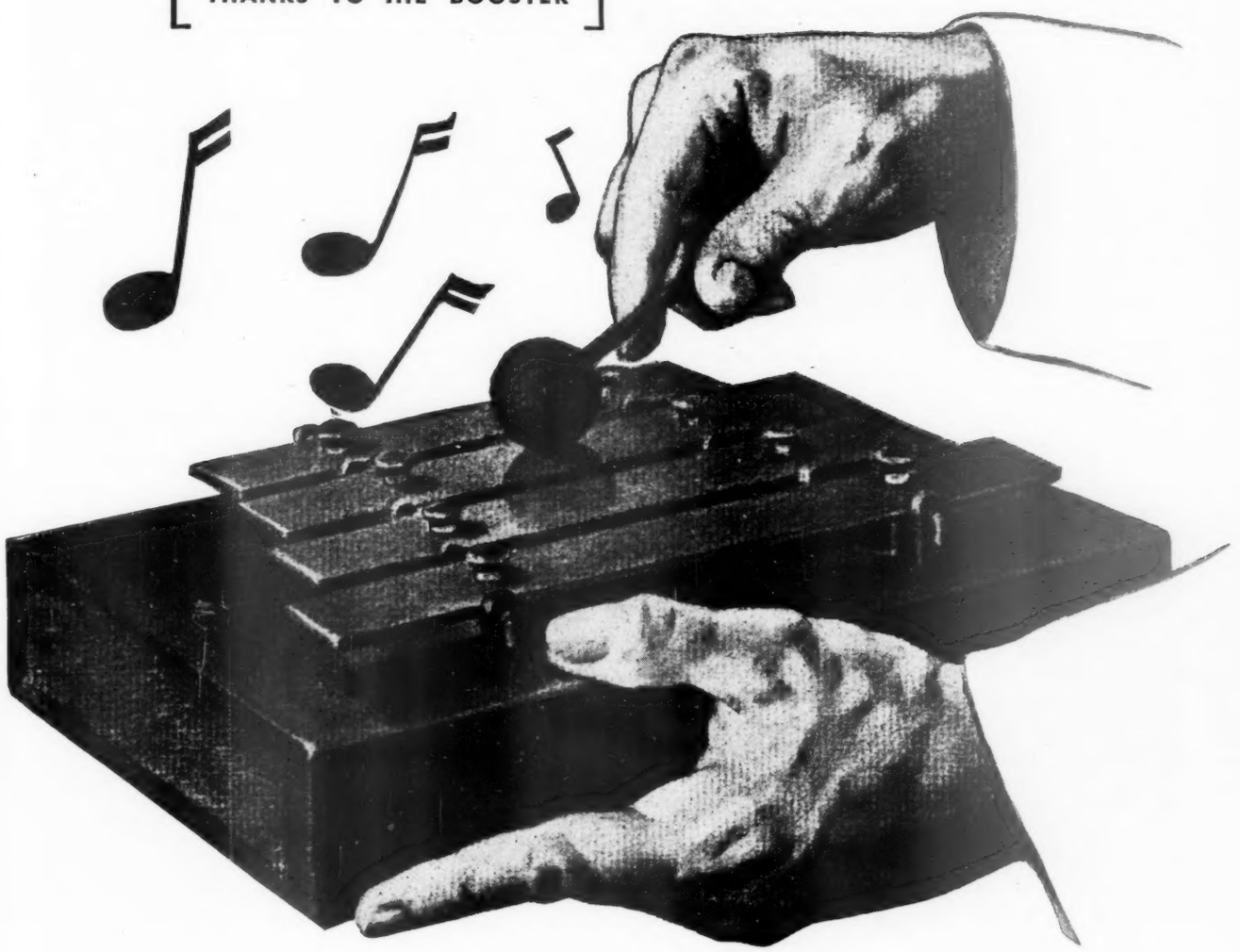
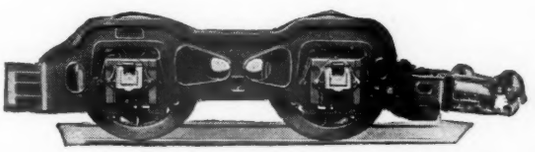


Ding, Dong, Ding—a welcome announcement to the hungry traveler. « « « Click, click, click, click, there's music in the smooth, swift gliding of a train over the rails. On modern trains the traveler can rest, eat or sleep—in comfort. Thanks to the Booster, travel is as smooth as an ocean liner on a calm sea. « « « The Booster cuts out starting shocks. Passengers ride in comfort—and tell about the advantages of train travel.



FRANKLIN RAILWAY SUPPLY CO., INC.

NEW YORK
CHICAGO
MONTREAL

dence showed that brace rods, generally flat in shape, are in practically universal use on box cars. The Atchison formerly used a flat rod, but, finding that such a rod frequently buckled, sometimes immediately under the ladder, abandoned it and adopted the stronger and less elastic round type in its place. This was in 1924 and the proof showed that for many years cars so equipped have been in general and constant operation on its lines. Its general foreman testified that he had never heard of an accident attributable or claimed to be attributable to the round brace rod except in this case. The record showed nothing to the contrary.

The court presumed from this long continued use that the Interstate Commerce Commission was aware of the situation and knowingly permitted its rule in respect of the ladder clearance to remain without change. The regulation had the force of a statute. And the railroad having strictly complied with it was held to have discharged its full duty so far as the ladder requirement of the Safety Appliance Act was concerned.

It was held that the brace rod did not constitute a part of the ladder. In itself, it was a contrivance separate and distinct from the ladder, designed and used for a purpose entirely apart from the use of that appliance. The plaintiff's right of recovery, if any, was held to be in a common law action based on the effect of the near proximity of the ladder to the rod neither being in itself defective, and not under the Safety Appliance Act. The question would be whether plaintiff assumed the risk. In that view, the court said, the plaintiff, in abandoning his claim under the common law rule of negligence, abandoned the only possible ground of recovery. [Atchison, Topeka & Santa Fe v. Scarlett. Decided March 29, 1937. Opinion by Justice Sutherland.]

Fan Trip to Alco Shops a "Sellout"

(*Continued from page 689*)

tivities by "swapping" notes of the field and snapping pictures of rolling stock. In an effort to indulge the photographers in their zeal, the locomotive company placed several completed engines in the finishing room in convenient locations for "shots" and took pains to spot the Chicago, Milwaukee, St. Paul & Pacific's new streamlined steam power so that the main rods were visible below the sheathing. Beside this new passenger locomotive, the party inspected a 2-8-4 built for the Wheeling & Lake Erie, an eight-wheel switcher completed for the Bessemer & Lake Erie, and a Diesel-electric switcher ready for the Patapsco & Back River.

The New York contingent of enthusiasts traveled under the care of W. T. Gaynor, assistant advertising manager, and the Boston group en route was under the supervision of W. A. Barrows, general passenger agent of the Boston & Albany. Each carload was under the watchful eyes of New York Central officers who volunteered their services as "monitors." Among these were G. N. Edmondson, engineer of track; R. M. Brown, assistant to general superintendent of motive power, and W. K. Wike, special assistant to the general manager.

The American Locomotive Company provided every facility for observation of operations. Officers of the company served as guides in directing various groups of the curious through the plant. Parts of locomotives were displayed in various stages of construction so that the visitors could understand visually as well as auricularly the technique of locomotive creation. For those afflicted with "picture-gallery feet," the company maintained automobiles at convenient points.

At late afternoon, the sportsmen of the rails sought their trains, jammed the observation platforms and dining cars, and rode home loaded with pamphlets, photos, and important knowledge.

Railways Advance Despite Handicaps

(*Continued from page 689*)

mined very slightly by court decisions and almost entirely by the public sentiment by which Congress, the commission and other agencies of government are controlled.

"Now, there is no question about what the public really wants. It wants adequate and better transportation at a cost that it can reasonably afford to pay. Also it wants continuance of private railway ownership and management. But whether the public will get these things will depend not on what it wants, but upon what it effectively demands from railway managements, and especially from the President and Congress. It is being threatened with legislation which would so enormously increase railway operating expenses that private ownership could not survive and which would make what it would have to pay for railroad transportation grossly excessive under either private or government ownership.

"The Railway Labor Act requires collective bargaining regarding wages and conditions of employment, and the demand for a 20 per cent advance in wages is being submitted to such bargaining. But the proposed legislation referred to also relates to wages and working conditions. Why, then, do the labor leaders go directly to Congress with their demands for the changes in wages and working conditions contemplated by this proposed legislation instead of submitting them to collective bargaining with the railways? We hear much denunciation of employers in other industries for trying to avoid collective bargaining. Why should the Senate of the United States adopt a resolution condemning employers for trying to avoid collective bargaining, as it did last week, and at the same time consider legislation involving demands by railway labor unions that under the provisions of the Railway Labor Act plainly should be submitted to collective bargaining? When did it become more pernicious for employers than for labor unions to try to avoid collective bargaining as provided by law?

"Whether the railways will be able to continue increasing their expenditures for needed enlargement and improvement of their service will depend on whether wholly unwarranted increases in their operating expenses and reductions of their net earnings are made by legislation or otherwise. They cannot continue to increase, or even maintain, these expenditures if prevented from making the net income required for this purpose, as they would be by such increases in their operating expenses. In fact, their entire future depends upon prevention of reduction or elimination of their still narrow margin between expenses and earnings. Such enormous increases of expenses as are being demanded by the labor unions mean government ownership and a huge railway deficit that could be paid only from increased taxation.

"The public can prevent them and government ownership only by preventing the federal government, and especially Congress, from doing things that inevitably would cause them."

Construction

DELAWARE & HUDSON. The New York Public Service Commission has ordered this company to prepare plans, specifications, an estimate of cost and to carry out the work of reconstructing a highway bridge over its tracks in the town of Chesterfield, N. Y. The plans provide for a steel structure at a cost of about $36,650.

DELAWARE & HUDSON.—The New York Public Service Commission has approved specifications and an estimate of cost of $102,210 for the elimination of the West Maple street and Corinth state crossings of this road in the village of Corinth, N. Y. The commission also authorized the railroad to do certain work in connection with the elimination by direct employment of labor and purchase of materials, limiting the cost to $18,000.

ELGIN, JOLIET & EASTERN.—This company has ordered from the Ross & White Company, Chicago, a special fireproof 10-ton capacity sand-storage tower with delivery equipment for sanding the corner boxes of Diesel locomotives, for erection at Gary, Ind.

GRAND TRUNK WESTERN.—This company has awarded a contract to the Ross & White Company, Chicago, for the construction of a 200-ton two-track structural-steel automatic electric coaling station for installation at Olivers, Ind.

GREAT NORTHERN.—A contract has been awarded to the Ross & White Company, Chicago, for the installation of two three-track cinder-handling plants, one at St. Paul, Minn., and the other at Minneapolis Junction.

NEW YORK CENTRAL.—A low bid of $153,421, submitted by the Walsh Construction Company, Syracuse, N. Y., for the elimination of the Congress street or Clutes crossing of this road in Schenectady, N. Y., has been approved by the New York Public Service Commission.

Continued on next left-hand page

NO. 11 OF A SERIES OF FAMOUS ARCHES OF THE WORLD

L'ARC DU CARROUSEL, PARIS

Erected in 1806 by Napoleon I to celebrate his victories at Ulm and Austerlitz, the Arc du Carrousel served as a monumental gateway to the Tuileries Gardens. In accordance with the very striking scheme employed by the architects who planned Paris, it was built on the axis of the Champs Elysées, the Arc de Triomphe de L'Etoile, and the obelisk of the Place de la Concorde. The latter two can be seen through the portal on the right. « « « Made of polished marble, the arch is beautifully decorated with statues, reliefs, and a brief record of the campaigns. The bronze steeds atop the arch were originally brought from St. Mark's Cathedral at Venice, but after Waterloo they were restored to the Cathedral and replaced with others by Louis XVIII.

* * *

Maintaining a complete Security Brick Arch in the locomotive firebox is essential to full fuel economy. To facilitate locomotive arch maintenance, the American Arch Company maintains an adequate stock of Security Arch Brick at conveniently located points throughout the country.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
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Locomotive Combustion Specialists » » »

Equipment and Supplies

Pennsylvania Equipment Program

The Pennsylvania will construct in its Altoona, Pa., works, the chasses for 11 electric locomotives and 2,800 new steel freight cars, at a total cost of $10,750,000. The cars include 1,000 double-door box, 50 ft. long, adapted to the transportation of general freight including automobiles; 1,500 mill-type gondola cars, 52 ft. long and of 70 tons' capacity. The order for this 2,500 was reported in the *Railway Age* of April 10, page 651. In addition, there will be 300 covered hopper cars for carrying, in bulk, cement and other commodities requiring protection from the weather. The 11 new electric passenger locomotives are to be of the G. G. 1 type. These locomotives will be assembled at Altoona, with electrical parts supplied by the electrical manufacturing companies. This construction will provide over five million man-hours of work for the employees of the railroad at Altoona and at the mills and other industries furnishing the electrical apparatus for the locomotives and materials and parts for the cars. The 11 locomotives will supplement 58 others of the G. G. 1 type and 28 of the slightly different P-5a type already in use for high-speed passenger service and will provide part of the additional motive power required for the extension of the electrification now under way westward to Harrisburg, Pa. The company plans to turn out all of the new box cars by mid-summer, most of the gondola and hopper cars to be completed by the end of the year and the 11 new electric locomotives early in 1938. The building of the new locomotives and 2,650 of the freight cars will be financed by a new equipment trust amounting to $7,740,000, representing about three-fourths of the cost, the remaining 25 per cent to be provided by the company. The 150 box cars not covered by this method of financing will be paid for out of an unexpended balance remaining from the sale of Series "G" equipment trusts issued in 1935 to finance the 10,000 new freight cars recently built.

LOCOMOTIVES

THE BANGOR & AROOSTOOK contemplates buying six steam locomotives.

THE ALIQUIPPA & SOUTHERN has ordered two steam switching locomotives of the 0-8-0 type, from the American Locomotive Company.

FREIGHT CARS

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has ordered 5,600 freight cars, as follows:

No.	Type	Capacity (tons)	Builder
1,250	H.S. Gondola	50	Amer. Car & Fd'y.
2,000	Box	40	Pullman-Standard
250	L.S. Gondola	50	Pullman-Standard
500	Box	40	Mt. Vernon
500	Automobile	40	Mt. Vernon
1,100	Hopper	50	Pressed Steel

Of these, 1,000 box, 250 low side gondola, 250 high side gondola and 600 hopper, a total of 2,100 cars, are for service on the Alabama Great Southern, and the other 3,500 cars are for service on the Cincinnati, New Orleans & Texas Pacific.

Inquiry for this equipment was reported in the *Railway Age* of March 27.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has placed an order with company shops for the construction of 500 fifty-ton steel hopper cars, 500 fifty-ton automobile cars, 1,000 gondola cars and 22 air dump cars. Construction was started in April.

PASSENGER CARS

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has placed an order with company shops for the modernization and air conditioning of 30 coaches, and the construction of 7 dining cars, 1 mail-express car and 5 coach-baggage cars. Work has already been started.

IRON AND STEEL

READING.—A contract has been given to the Phoenix Bridge Company, for 168 tons of steel for bridge construction work at Coatesville, Pa. Young Bros., Inc., are the contractors.

LEHIGH VALLEY.—A contract for 240 tons of steel has been let to the Phoenix Bridge Company, New York, for use in connection with grade crossing elimination work at Mendon, N. Y.

MOTOR VEHICLES

DENVER, COLORADO SPRINGS & PUEBLO MOTOR WAY has ordered one 36-passenger bus from the American Car & Foundry Motors Company.

THE SANTA FE TRAILS OF ILLINOIS has ordered one 28-passenger bus from the American Car & Foundry Motors Company.

SIGNALING

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has ordered from the Union Switch & Signal Co., 30 sets of three-indication cab signal equipment for installation on a like number of new locomotives now being built by the Baldwin Locomotive Works. These equipments will be similar to those now in service on locomotives in operation between Portage, Wis., and Minneapolis, Minn.

THE UNION PACIFIC SYSTEM has placed orders with the Union Switch & Signal Co., for 20 sets of two-indication cab signal equipment with audible warning signal and acknowledging device to be applied to 20 new locomotives being built by the American Locomotive Company. This equipment will be the same as that now in service on Union Pacific steam locomotives operating in cab signal territory between North Platte, Neb., and Cheyenne, Wyo. The Union Pacific also ordered from the Union Switch & Signal Co., two sets of two-indication cab signal and speed control equipment to be installed on turbo-electric locomotives, now under construction by the General Electric Company at Erie, Pa. These equipments are arranged for operation over the tracks of the Chicago & North Western and the Oregon-Washington Railroad & Navigation as a speed control system, over the tracks of the Union Pacific as a cab signal system, and over the Southern Pacific Company's lines as an intermittent automatic stop system. The Union Switch & Signal Co. is also furnishing the Union Pacific with two sets of similar equipment, except for application to two 5,400-hp. Diesel locomotives now being built at the plant of the Electro-Motive Corporation at La Grange, Ill.

Supply Trade

G. H. Bucher has been elected a director of the **Westinghouse Electric & Manufacturing Company.** Mr. Bucher is executive vice-president of this company; also president of the Westinghouse Electric International Company.

Howard H. McClintic, Jr., formerly executive vice-president of the **Pittsburgh Piping and Equipment Company,** has been elected president of the **Ferguson and Edmondson Company,** and **C. R. Carter** has been elected vice-president and manager.

W. J. Montgomery of the **Sherwin-Williams Company,** Cleveland, Ohio, has been appointed general manager of transportation sales for this company. Mr. Montgomery, who succeeded K. H. Wood, now vice-president and general sales manager for the company, has for some years, served as assistant manager of transportation sales.

The American Brake Shoe & Foundry Company, New York, has consolidated the **American Forge Company** and the **Southern Wheel Company** with the parent company. These are now known as the **American Forge** and **Southern Wheel Divisions,** respectively, of The American Brake Shoe & Foundry Company. Consolidation of certain other subsidiary companies, and their organization as divisions of The American Brake Shoe & Foundry Company, will take place as fast as is practicable. In line with this program of creating a division which is devoted to the production and sale of a particular line of products, the **Brake Shoe Division** has recently been created. This division produces, in addition to brake shoes, certain miscellaneous iron castings. **Maurice N. Trainer,** vice-president, has been placed in charge of the Brake Shoe Division and all departments of this division now report to him.

OBITUARY

Horace S. Wilkinson, chairman of the board of the Crucible Steel Company of America, died in the Blackstone Hotel, Chicago, on April 11. Mr. Wilkinson was 68 years old at the time of his death.

Continued on next left-hand page

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Financial

ARKANSAS VALLEY INTERURBAN.—*Reorganization.* — The Interstate Commerce Commission, Division 4, has announced that hearings on this company's reorganization plan will be held before Examiners R. H. Jewell and C. A. Bernhard at the office of the commission in Washington, D. C., on May 6.

BANGOR & AROOSTOOK.—*Annual Report.*—The annual report of this company for 1936 shows net income of $747,251, a decrease of $126,501 as compared with net income for 1935. Selected items from the income statement follow:

	1936	Compared with 1935 Increase or Decrease
RAILWAY OPERATING REVENUES	$5,985,120	−$82,076
Maintenance of way	1,055,657	−45,485
Maintenance of equipment	1,036,954	+36,242
Transportation	1,544,302	+14,422
TOTAL OPERATING EXPENSES	3,987,772	+18,402
Operating ratio	66.63	+1.21
NET REVENUE FROM OPERATIONS	1,997,347	−100,479
Railway tax accruals	559,237	+48,724
Railway operating income	1,438,110	−149,204
Net Rents	4,801	−10,999
NET RAILWAY OPERATING INCOME	1,433,308	−160,203
Non-operating income	43,420	+1,141
TOTAL INCOME	1,476,728	−159,062
Interest on funded debt	709,397	−35,646
TOTAL FIXED CHARGES	722,670	−26,073
NET INCOME	$747,251	−$126,501

BESSEMER & LAKE ERIE.—*Annual Report.*—The annual report of this company for 1936 shows net income, after interest and other charges, of $5,929,613, as compared with net income of $2,425,497 in 1935. Selected items from the income account follow:

	1936	1935	Increase or Decrease
RAILWAY OPERATING REVENUES	$15,467,347	$9,828,106	+$5,639,241
TOTAL OPERATING EXPENSES	7,593,566	6,501,024	+1,092,542
NET REVENUE FROM OPERATIONS	7,873,781	3,327,082	+4,546,698
Railway tax accruals	1,721,022	727,607	+993,414
Railway operating income	6,152,759	2,599,464	+3,553,294
Net rents	567,718	303,194	+264,524
NET RAILWAY OPERATING INCOME	6,720,477	2,902,658	+3,817,819
Non-operating income	104,773	78,564	+26,208
GROSS INCOME	6,825,251	2,981,223	+3,844,028
Rent for leased roads	5,952	5,953	−1
Interest on funded debt	627,916	516,650	+111,266
TOTAL FIXED CHARGES	642,000	523,767	+118,233
NET INCOME	$5,929,613	$2,425,497	+$3,504,116

BOSTON AND MAINE.—*Annual Meeting.*—At the annual meeting of the stockholders of this company issues of bonds totaling $48,000,000 for refunding purposes were authorized.

CARLTON & COAST.—*R.F.C. Loan Extended.*—The Interstate Commerce Commission, Division 4, has approved an extension of this company's Reconstruction Finance Corporation loan of $490,296 for a period ending not later than May 1, 1941.

CENTRAL OF GEORGIA.—*Annual Report.*—The 1936 annual report of this company shows net deficit, after interest and other charges, of $2,027,022 as compared with net deficit of $2,248,198 in 1935. Selected items from the income statement follow:

	1936	1935	Increase or Decrease
Average Mileage Operated	1,926.63	1,926.63	.....
RAILWAY OPERATING REVENUES	$15,932,357	$14,473,737	+$1,458,620
Maintenance of way	1,940,264	1,732,864	+207,400
Maintenance of equipment	3,287,767	3,093,473	+194,293
Transportation—Rail	6,364,275	5,953,668	+410,606
TOTAL OPERATING EXPENSES	13,292,495	12,224,589	+1,067,905
Operating ratio	83.43	84.46	−.....
NET REVENUE FROM OPERATIONS	2,639,862	2,249,147	+390,714
Railway tax accruals	1,137,601	857,581	+280,019
Railway operating income	1,502,261	1,391,565	+110,695
Equipment rents—Net Dr.	130,094	208,502	−78,408
Joint facility rents—Net Dr.	132,362	143,553	−11,191
NET RAILWAY OPERATING INCOME	1,239,804	1,039,509	+200,294
Non-operating income	397,926	401,853	−3,927
GROSS INCOME	1,637,730	1,441,363	+196,366
Rent for leased roads and equipment	392,055	393,389	+1,334
Interest on funded debt	2,803,183	2,887,303	−84,120
TOTAL DEDUCTIONS FROM GROSS INCOME	3,664,753	3,689,561	−24,808
NET INCOME	*$2,027,022	*$2,248,198	+$221,175

* Deficit.

CHICAGO & NORTH WESTERN.—*Annual Report.*—The 1936 annual report of this company shows net deficit, after interest and other charges, of $9,674,004, as compared with net deficit of $11,070,348 in 1935. Selected items from the income account follow:

	1936	1935	Increase or Decrease
Average Mileage Operated	8,465.39	8,421.89	43.50
RAILWAY OPERATING REVENUES	$91,969,298	$77,315,017	+$14,654,281
Maintenance of way	15,117,216	12,427,546	+2,689,670
Maintenance of equipment	20,125,401	16,803,416	+3,321,984
Transportation	35,618,353	30,591,667	+5,026,685
TOTAL OPERATING EXPENSES	77,030,000	65,348,579	+11,681,421
Operating ratio	83.76	84.52	−.76
NET REVENUE FROM OPERATIONS	14,939,298	11,966,438	+2,972,859
Equipment rents—Net	2,517,271	2,795,651	−278,380
Joint facility rents—Net	153,987	200,730	−46,743
NET RAILWAY OPERATING INCOME	5,260,641	3,578,483	+1,682,157
Non-operating income	1,809,455	2,373,455	−563,999
GROSS INCOME	7,070,096	5,951,938	+1,118,158
Rent for leased roads	3,738	3,440	+297
Interest on funded debt	14,127,685	15,511,456	−1,383,770
TOTAL FIXED CHARGES	16,702,496	16,961,779	−259,282
NET DEFICIT	$9,674,004	$11,070,348	−$1,396,343

CENTRAL OF NEW JERSEY.—*Construction.*—This company has applied to the Interstate Commerce Commission for authority to construct and operate a line of railroad in Bayonne, N. J., to connect with the proposed rail-ocean terminal, approximately 1.87 miles.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Abandonment.*—The trustees have applied to the Interstate Commerce Commission for authority to abandon a branch line extending from Kapowsin Junction, Wash., to Electron, 2.01 miles.

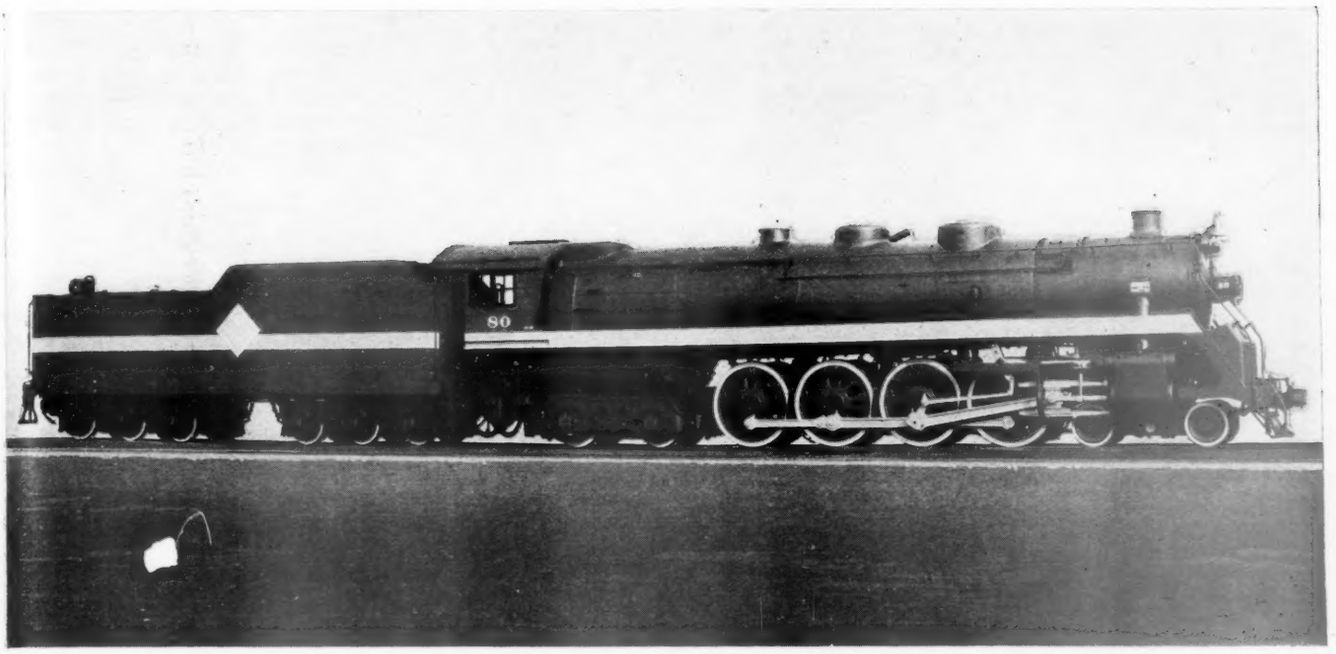
CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Annual Report.*—The 1936 annual report of this company shows net deficit, after interest and other charges, of $2,023,333, as compared with a net deficit of $2,302,707 in 1935. Selected items from the income account follow:

	1936	1935	Increase or Decrease
Average Mileage Operated	1,648.34	1,652.69	−4.35
RAILWAY OPERATING REVENUES	$18,328,049	$15,446,158	+$2,881,891
Maintenance of way	2,302,815	1,943,772	+359,042
Maintenance of equipment	3,096,935	2,602,200	+494,734
Transportation	8,503,978	7,406,322	+1,097,655
TOTAL OPERATING EXPENSES	15,274,934	13,281,704	+1,993,229
Operating ratio	83.34	85.99	−2.65
NET REVENUE FROM OPERATIONS	3,053,115	2,164,453	+888,661
Equipment rents—Net	1,035,546	761,973	+273,572
Joint facility rents—Net	374,880	365,346	+9,534
NET RAILWAY OPERATING INCOME	427,645	175,577	+252,068
Non-operating income	69,439	70,901	−1,461
GROSS INCOME	497,085	246,478	+250,606
Rent for leased roads	1,702	1,702	.....
Interest on funded debt	2,358,636	2,375,036	−16,399
TOTAL FIXED CHARGES	2,512,890	2,543,375	−30,485
NET DEFICIT	$2,023,333	$2,302,707	−$279,374

DENVER & RIO GRANDE WESTERN.—*Reorganization.*—Hearings on the debtor's plan for the reorganization of this company were held this week in Washington before the finance division of the Interstate Commerce Commission.

DENVER & RIO GRANDE WESTERN.—*Joint Operation.* — The Interstate Commerce

Continued on next left-hand page



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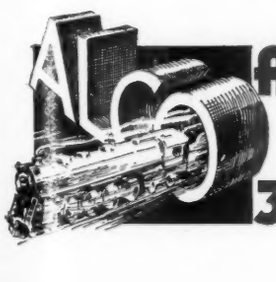
Strictly Modern
4-8-4 fast freight locomotive
for roads with
limited axle loadings

NEW POWER — NEW PROFITS

P. S. It is estimated that weekly car loadings this fall will pass 900,000

Weight on Drivers	204,000 pounds	Diameter of Drivers	69 inches
Weight of Engine	361,000 pounds	Boiler Pressure	250 pounds
Cylinders	23½ x 30 inches	Maximum Tractive Power	51,000 pounds



AMERICAN LOCOMOTIVE COMPANY

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Commission, Division 4, has authorized the trustees to operate under trackage rights over certain tracks of the Colorado & Southern between Larimer and Twelfth Sts. in Denver, Colo., 3,554 ft., and to construct a connecting track with the Colorado & Southern from Larimer to Lawrence Sts. in Denver, Colo., 375 ft.

DETROIT & MACKINAC.—*Annual Report.*—The 1936 annual report of this railway shows net income, after interest and other charges, of $12,016, as compared with a net deficit of $53,160 in 1935. Selected items from the income account follow:

	1936	1935	Increase or Decrease
RAILWAY OPERATING REVENUES	$803,484	$654,505	+$148,978
Maintenance of way	126,113	120,962	+5,151
Maintenance of equipment	140,203	119,667	+20,536
Transportation	286,450	263,109	+23,341
TOTAL OPERATING EXPENSES	605,305	548,623	+56,682
NET REVENUE FROM OPERATIONS	198,178	105,882	+92,296
Railway tax accruals	21,118	15,247	+5,870
Railway operating income	177,060	90,572	+86,487
Equipment rents	†45,009	†26,023	−18,985
Joint facility rents	†1,308	†1,005	−303
TOTAL INCOME	133,384	66,238	+67,145
Interest on funded debt	109,360	108,346	+1,013
NET INCOME	$12,016	*$53,160	+$65,177

* Deficit.
† Debit.

FLORIDA EAST COAST.—*Annual Report.*—The annual report of this road for 1936 shows net deficit, after interest and other charges, of $2,071,631, as compared with net deficit of $3,222,759 in 1935. Selected items from the income account follow:

	1936	1935	Increase or Decrease
Average Mileage Operated	705.34	778.45	73.11
RAILWAY OPERATING REVENUES	$8,614,508	$7,728,265	+$886,242
Maintenance of way	1,181,018	1,430,913	−249,894
Maintenance of equipment	1,625,897	1,676,884	−50,986
Transportation—Rail	2,801,966	2,733,525	+68,441
TOTAL OPERATING EXPENSES	6,515,854	6,694,207	−178,353
NET REVENUE FROM OPERATIONS	2,098,653	1,034,057	+1,064,595
Railway tax accruals	770,304	805,362	−35,057
Railway operating income	1,328,348	228,695	+1,099,653
Equipment rents—Net Dr.	435,338	429,313	+6,024
Joint facility rents—Net Dr.	15,214	21,974	−6,760
NET RAILWAY OPERATING INCOME	877,795	*222,692	+1,100,388
Non-operating income	107,157	84,761	+22,396
GROSS INCOME	984,953	*137,831	+1,122,785
Interest on funded debt	2,957,280	2,966,354	−9,073
NET INCOME	*$2,071,631	*$3,222,759	+$1,151,128

* Deficit.

ILLINOIS CENTRAL.—*Equipment Trust.*—This company has asked for bids on an issue of $7,050,000 of equipment trust certificates.

MERIDIAN & BIGBEE RIVER.—*R.F.C. Loan Extension.*—W. E. Hopkins, trustee, has applied to the Reconstruction Finance Corporation for an extension from April 12, for two years, of a loan of $744,252 which is secured by eight notes.

MINNEAPOLIS & ST. LOUIS.—*Receivers' Certificates.*—Lucien C. Sprague and John Junell, co-receivers, have applied to the Interstate Commerce Commission for authority to issue $1,007,250 of receivers' certificates of indebtedness in renewal of an obligation of like amount now outstanding.

MISSOURI PACIFIC.—*Reorganization.*—The Interstate Commerce Commission, Division 4, has postponed from April 19 to May 4 further hearings in connection with this company's reorganization plan.

NEW YORK CENTRAL.—*Bond Redemption.*—Directors have authorized calling for redemption on July 1 $22,988,000 of Big Four refunding 5 per cent bonds and $1,052,600 of 6 per cent bonds.

NORFOLK SOUTHERN.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized the receivers to abandon a line extending from Morehead City, N. C., to Beaufort, 3.17 miles; and to abandon operation of a line of the Atlantic & North Carolina extending from Goldsboro, N. C., to Morehead City, 95.81 miles. The latter line will continue to be operated by the Atlantic & North Carolina.

PEORIA & PEKIN UNION.—*Annual Report.*—The 1936 annual report of this company shows net income, after interest and other charges, of $112,999, as compared with net income of $113,470 in 1935. Selected items from the income account follow:

	1936	1935	Increase or Decrease
RAILWAY OPERATING REVENUES	$1,227,798	$1,004,412	+$223,386
TOTAL OPERATING EXPENSES	912,627	828,938	+83,688
NET REVENUE FROM OPERATIONS	315,171	175,473	+139,697
Railway tax accruals	167,988	105,108	+62,879
Railway operating income	147,182	70,365	+76,817
Net Rents	117,967	194,523	−76,555
NET RAILWAY OPERATING INCOME	265,150	264,888	+261
Non-operating income	21,784	22,694	−909
TOTAL INCOME	286,934	287,582	−647
Rent for leased roads and equipment	1,500	1,500	.....
Interest on funded debt	167,695	167,842	−147
TOTAL FIXED CHARGES	172,611	172,696	−84
NET INCOME	$112,999	$113,470	−$470

PENNSYLVANIA.—*Annual Meeting.*—At the annual meeting of the stockholders of this company on April 13, the directors were empowered to increase the bonded indebtedness of the company by $95,000,000, in the event that additional financing is needed. A formal stock vote on this increase in debt will be taken on April 27, at which time three expiring directorships are also to be filled.

PITTSBURGH, CHARTIERS & YOUGHIOGHENY.—*Annual Report.*—The 1936 annual report of this road shows net income, after interest and other charges of $145,680, an increase of $1,250 as compared with 1935 net income. Selected items from the income statement follow:

	1936	Compared with 1935 Increase or Decrease
RAILWAY OPERATING REVENUES	$417,201	+$58,990
Maintenance of way	30,590	+20,240
Maintenance of equipment	29,033	+6,402
Transportation	156,507	+28,121
TOTAL OPERATING EXPENSES	231,020	+53,464
NET REVENUE FROM OPERATIONS	186,181	+5,526
Railway tax accruals	53,760	+4,366
Railway operating income	132,421	+1,180
Hire of equipment	2,426	+3,431
Joint facility rents—Dr.	9,427	−3,422
NET RAILWAY OPERATING INCOME	120,566	+1,171
Non-operating income	25,302	−767
GROSS INCOME	145,869	+403
TOTAL DEDUCTIONS FROM GROSS INCOME	188	−846
NET INCOME	$145,680	+$1,250

PENNSYLVANIA.—*Equipment Trust.*—This company will seek authorization of the Interstate Commerce Commission for the issue and sale of $7,740,000 of equipment trust certificates.

PERE MARQUETTE.—*Equipment Trust Certificates.*—A banking group headed by Brown, Harriman & Co., Inc., and including Blyth & Co., Inc., and Laurence M. Marks & Co., are offering an issue of $1,940,000 of this road's 2¾ per cent equipment trust certificates at prices to yield from 1.30 to 3.40 per cent, according to maturity. The certificates were awarded on the banking group's bid of 97.531. The certificates are dated May 1, 1937, and mature $194,000 annually from May 1, 1938, to May 1, 1947, inclusive.

RUTLAND, TOLUCA & NORTHERN.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company, J. R. Cox and Lura Cox, and the Milwaukee, Rockford & Southwestern to abandon a line extending from Granville, Ill., to Toluca, 20.88 miles.

ST. LOUIS-SAN FRANCISCO.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized the trustees to abandon the St. Paul branch, extending from Fayette Junction, Ark., to Pettigrew, 40.9 miles.

SOUTHERN.—*Equipment Trust.*—The Cincinnati, New Orleans & Texas Pacific has asked for bids on $6,800,000 of equipment trust certificates and the Alabama Great Southern on an issue of $3,825,000.

SOUTHERN PACIFIC.—*Annual Meeting.*—At the annual meeting of the stockholders of this company held this week all directors were re-elected.

ST. LOUIS-SAN FRANCISCO.—*Counsel's Fees.*—The Interstate Commerce Commission, Division 4, has ordered that the sum

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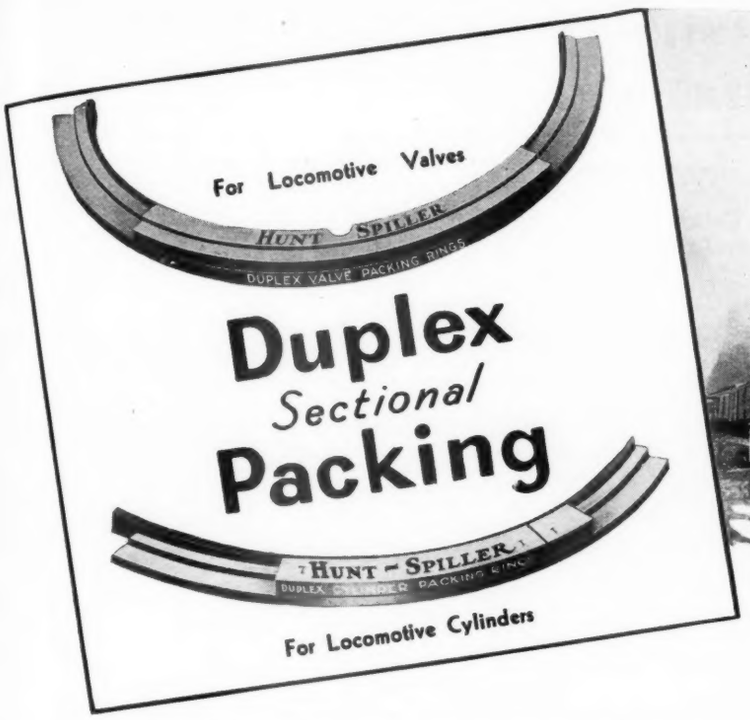

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THE locomotive of today accomplishes a great deal more work in proportion to its size than its predecessors and at lower cost per ton mile.

Duplex Sectional Packing has helped in a large way to establish and maintain this outstanding record.

Highly resistant to wear, it remains steam tight over long periods of time, reduces fuel consumption, renewals and general maintenance costs.

Equip the cylinders and valve chambers of your power with HUNT-SPILLER Duplex Sectional Packing. The economies effected will surprise and please you.

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Dunbar Sectional Type Packing
Duplex Sectional Type Packing for Cylinders and Valves
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
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of $20,000 be paid to Frank A. Thompson and Ivan H. Light as counsel to John G. Lonsdale, co-trustee of this company, for their services in the trust fund proceedings.

SOUTHERN PACIFIC.—*Abandonment.*—Examiner Jerome K. Lyle of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that the Central Pacific be permitted to abandon the portion of its Mina branch extending from Tonopah Junction, Nev., to Benton, Cal., 50 miles, and that the Southern Pacific be permitted to abandon operation of the line.

VIRGINIAN.—*Annual Report.*—The annual report of this company and its subsidiary companies for 1936 shows net income, after interest and other charges, of $6,451,699, as compared with net income of $4,143,336 in 1935, an increase of $2,308,362. Selected items from the consolidated income statement follow:

	1936	1935	Increase or Decrease
Average Mileage Operated	619.33	619.33	.....
RAILWAY OPERATING REVENUES	$17,640,016	$15,783,579	+$1,856,436
TOTAL OPERATING EXPENSES	7,865,819	7,178,907	+686,911
Operating ratio	44.59	45.48	−0.89
NET REVENUE FROM OPERATIONS	9,774,196	8,604,672	+1,169,524
Railway tax accruals	1,455,000	1,936,300	−481,300
Railway operating income	8,319,196	6,668,341	+1,650,854
Equipment rents—Net	704,300	511,536	+192,764
Joint facility rents—Net	44,765	43,275	+1,490
NET RAILWAY OPERATING INCOME	9,068,263	7,223,153	+1,845,109
Non-operating income	45,225	71,847	−26,621
TOTAL INCOME	9,113,488	7,295,001	+1,818,487
Interest on funded debt	2,599,479	3,115,205	−515,725
TOTAL FIXED CHARGES	2,642,712	3,118,623	−475,910
NET INCOME	$6,451,699	$4,143,336	+$2,308,362

WABASH.—*Preliminary Statement.*—In the item published on page 654 of the *Railway Age* of April 10 giving excerpts from the income statement of the above company for 1936, the figure for Total Operating Expenses for 1936 was incorrectly given as $34,445,113. This figure should read $34,334,112, making the increase over the 1935 figure $3,087,560.

Average Prices of Stocks and Bonds

	Apr. 13	Last week	Last year
Average price of 20 representative railway stocks..	58.13	58.15	49.08
Average price of 20 representative railway bonds..	81.09	81.71	80.26

Dividends Declared

Cleveland, Cincinnati, Chicago & St. Louis.—Preferred, $1.25, quarterly, payable April 30 to holders of record April 20.

Kansas City, St. Paul & Chicago.—6 Per Cent Preferred Guaranteed, $1.50, quarterly, payable May 1 to holders of record April 19.

Piedmont & Northern.—75c, quarterly, payable April 10 to holders of record April 2.

Pittsburgh, Bessemer & Lake Erie.—75c, semi-annually, payable October 1 to holders of record September 15; 6 Per Cent Preferred, $1.50, semi-annually, payable June 1.

Railway Officers

EXECUTIVE

Gray to Retire As U. P. Head: Jeffers To Be Successor

Carl R. Gray, president of the Union Pacific for the last 17 years, will retire on October 1 or three days after he becomes 70 years of age, which is the retirement age under the company's rules. Mr. Gray has insisted that no exception to the retirement rules be made in his case. He will continue in the service of the company as vice-chairman of the board of directors with headquarters at New York. William M. Jeffers, executive vice-president, will succeed Mr. Gray as president. Both now have headquarters at Omaha, Neb.

P. H. Goodwyn, commerce agent for the Louisville & Nashville, has been appointed assistant to the traffic vice-president with headquarters at Louisville, Ky., to succeed **E. R. Roby,** whose appointment as assistant to freight traffic manager is noted elsewhere in these columns.

F. H. Knickerbocker, general manager of the Southwestern district of the Union Pacific, with headquarters at Los Angeles, Cal., has been promoted to assistant to the president, with headquarters at Seattle, Wash., to succeed **Arthur A. Murphy,** who has been transferred to Los Angeles to fill a newly-created position. **Frank Strong,** industrial engineer, has been promoted to manager of industrial development of the Union Pacific, to vice-president of the Las Vegas Land & Water Company and to president of the Overland Terminal Warehouse Company, the latter two companies being subsidiaries of

F. H. Knickerbocker

the Union Pacific. All of these appointments became effective on April 15.

Mr. Knickerbocker has been identified with the Union Pacific and its affiliated lines for 38 years. He was born on December 10, 1875, at Chicago and first entered railway service in 1897, as a stenographer in the general freight department of the Oregon Short Line (part of the U. P. System) at Salt Lake City, Utah. Three years later he was advanced to secretary to the general superintendent and in 1902 he was made secretary to the vice-president and general manager. After six years in that capacity he was further promoted to assistant to the vice-president and general manager and in 1915 he was made general superintendent with headquarters at Pocatello, Idaho. In 1922 Mr. Knickerbocker left this company to become general manager of the Alaska Steamship Company and the Copper River & North Western, with headquarters at Seattle. Since 1924 he has been general manager of the Union Pacific at Los Angeles, his jurisdiction extending over the Los Angeles & Salt Lake, which is now known as the Southwestern district of the Union Pacific.

FINANCIAL, LEGAL AND ACCOUNTING

W. J. Stevenson, general solicitor of the New York, Chicago & St. Louis (Nickel Plate), whose appointment as

W. J. Stevenson

general counsel was reported in the *Railway Age* of April 10, was born on February 20, 1886, in Illinois. Mr. Stevenson attended Monmouth College and obtained his legal education at the Harvard Law School, graduating in 1910. On October 5 of the same year he entered the law department of the New York Central, remaining with this company until August 1, 1914, when he entered private practice at Monmouth, Ill., serving as city attorney at Monmouth from 1917 to 1919. On April 1 of the latter year he was appointed general solicitor for the United States Railroad Administration, with duties pertaining particularly to the Nickel Plate. On March 1, 1920, when the railroads were returned to their owners, Mr. Stevenson was appointed general solicitor of the Nickel Plate, which position he held until his recent appointment as general counsel, with headquarters as before at Cleveland, Ohio.

OPERATING

P. B. Bridges, assistant superintendent on the Gulf, Mobile & Northern with headquarters at Jackson, Miss., has been

Continued on next left-hand page

THEY TOOK NO CHANCES

when selecting boiler tubes

for the New Haven's 10 New Streamliners

ADVANTAGES OF NATIONAL SEAMLESS BOILER TUBES

Seamless—no uncertainty about full wall strength in every tube.

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Thorough uniformity assured by careful metallurgical supervision.

More than 45 years of satisfactory performance in railroad service.

Comply with all recognized specifications for water-tube or fire-tube boilers.

THESE high-speed locomotives are the last word in steam-traction design. Their construction means improved service, lower operating costs, and less maintenance expense on the important run between Boston and New Haven. Boiler tubes, superheater tubes, superheater flues — 100% NATIONAL Seamless.

Builders of these locomotives gave just as serious thought to the selection of boiler tubes as they gave to the selection of traction equipment. These men know that there can be no compromise with quality in the heart of the locomotive. Extensive tests confirmed their experience. And they selected NATIONAL Seamless.

NATIONAL Seamless Boiler Tubes are safe—they are pierced from billets of solid steel, which means uniform wall strength throughout. In more than 45 years of lasting, trouble-free service, they have proved their ability to stand up under high pressures—to minimize replacements and cut repair bills.

For tubing and retubing, take a tip from leading locomotive builders — NATIONAL Seamless Boiler Tubes.

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UNITED STATES STEEL

promoted to the newly-created position of superintendent of the Alabama and Louisiana divisions with the same headquarters.

H. J. Plumhof, general manager of the Central district of the Union Pacific with headquarters at Salt Lake City, Utah, has had his jurisdiction extended over the Southwestern district following the appointment of **F. H. Knickerbocker,** general manager of the Southwestern district, at Los Angeles, Cal., to the position of assistant to president at Seattle, which is noted elsewhere in these columns. **F. C. Paulsen,** superintendent with headquarters at Pocatello, Ida., has been promoted to the newly-created position of general superintendent with headquarters at Salt Lake City. **T. E. Williams,** superintendent of the Western division with headquarters at Green River, Wyo., has been transferred to Pocatello to replace Mr. Paulsen, and has been succeeded by **B. O. Wedge,** assistant superintendent at Cheyenne, Wyo. These appointments became effective on April 15.

TRAFFIC

E. R. Roby, assistant to the traffic vice-president of the Louisville & Nashville, has been appointed assistant to the freight traffic manager with headquarters as before at Louisville, Ky., to succeed **Ben F. Morris,** whose appointment as assistant to the vice-president in charge of traffic was reported in the *Railway Age* of April 10. **J. J. Schuler** has been appointed assistant general freight agent with headquarters at Louisville, to succeed **H. E. Kremer,** deceased.

William A. Huse, whose appointment as assistant freight traffic manager of the Norfolk & Western at Roanoke, Va., was announced in the *Railway Age* of April 3,

William A. Huse

was born in Roanoke on October 28, 1874. After education in the public schools of Roanoke, he entered railway service in May, 1890, as clerk in the traffic department of the Shenandoah Valley (predecessor of the N. & W.). He became clerk with the Great Southern Despatch on August 1, 1896, and on October 1, 1899, went to the office of the general freight agent of the Norfolk & Western as clerk, returning to the Great Southern Despatch office as chief clerk on May 1, 1905. On June 1, 1909, Mr. Huse was appointed chief clerk to the assistant general freight agent of the N. & W.; on February 1, 1913, chief rate clerk in the traffic department; and on June 1, 1913, chief clerk to the general freight agent. He was promoted to division freight agent at Roanoke on March 23, 1920, then to coal freight agent on January 1, 1922, and finally to assistant general freight agent at Roanoke in June, 1922, which position he has held until his recent appointment as assistant freight traffic manager.

MECHANICAL

R. G. McAndrew, who has been appointed superintendent of motive power of

R. G. McAndrew

the New York, Ontario & Western, with headquarters at Middletown, N. Y., as reported in the *Railway Age* of April 10, was born on February 25, 1895, at St. Thomas, Ont. He was graduated from the University of Michigan (B.S.M.E.) and entered railroad service in 1916 as special apprentice with the Michigan Central. From 1919 to 1923 Mr. McAndrew served as roundhouse foreman for the Michigan Central and from 1923 to 1928 he was drafting, testing and roundhouse foreman of the Denver & Rio Grande Western. He was appointed mechanical engineer of the New York, Ontario & Western in 1929, which position he held until his recent appointment as superintendent of motive power.

SPECIAL

M. T. MacLaury has been appointed supervisor of wage schedules in the Chicago territory for the New York Central and its subsidiaries.

OBITUARY

Joseph H. Nash, who resigned in 1930 as superintendent of motive power of the Illinois Central, died at his home at Chicago on April 14 after a long illness.

George F. Baker, general adjuster of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Chicago, died on April 8 at Woodbury, Ga. A native of New York State, Mr. Baker studied law and practiced at Iowa Falls, Iowa, until 1890, when he entered the service of the Milwaukee as an investigator in the claim department. In November, 1910, he was appointed assistant general adjuster and in 1918 he was further advanced to general adjuster.

Herbert J. Reynolds, assistant superintendent of the New York division of the New York, New Haven & Hartford, with headquarters at New York, died on April 12 at Daytona Beach, Fla., after several months' illness, at the age of 69.

H. R. Talcott, assistant chief engineer of the Baltimore & Ohio, with headquarters at Baltimore, Md., died on April 6 at his home in Washington, D. C. Mr. Talcott was born at Richmond, Va., on November 9, 1861, and entered the service of the Chesapeake & Ohio in October, 1879, in the engineering department. From 1881 to August, 1884, he was engaged in engineering successively on the Western of North Carolina (now Atlantic Coast Line), the United States Fish Commission, the United States Coast & Geodetic Survey, and the Richmond, Fredericksburg & Potomac. From August, 1884, to July, 1892, he was engaged in construction work on the Baltimore & Ohio and other companies. In March, 1894, Mr. Talcott became vice-president of the Seattle Coal & Iron Company, then serving as agent for the receiver of this company until December, 1897, and simultaneously from April, 1894, to June, 1897, as chief engineer of the Seattle Lake Shore & Eastern (Northern Pacific). He then served until March, 1903, as chief engineer of the Seattle & International (Northern Pacific); assistant in charge of construction from Skagway, Alaska, to Lake Bennett, B. C., of the White Pass & Yukon; resident engineer of

H. R. Talcott

the Seattle division of the Northern Pacific; treasurer of the Taft-Pierce Manufacturing Co. of Woonsocket, R. I. Mr. Talcott became assistant engineer in charge of survey and location of the Baltimore & Ohio, in March, 1903, being promoted to engineer of survey in March, 1905. On June 15, 1917, he was advanced to assistant chief engineer, the position he held until his death. Mr. Talcott was a member of the American Society of Civil Engineers.

Operating Revenues and Operating Expenses of Class I Steam Railways

Compiled from 139 Monthly Reports of Revenues and Expenses Representing 143 Class I Steam Railways

FOR THE MONTH OF FEBRUARY, 1937 AND 1936

Item	United States		Eastern District		Southern District		Western District	
	1937	1936	1937	1936	1937	1936	1937	1936
Average number of miles operated	236,071	236,845	58,394	58,637	44 804	44,949	132,873	133,259
Revenues:								
Freight	$264,167,016	$245,119,833	$115,758,696	$111,244,945	$53,497,872	$51,007,520	$94,910,448	$82,867,368
Passenger	[1] 33,015,926	[2] 31,902,349	17,624,818	18,334,437	5,837,225	5,327,691	9,553,883	8,240,221
Mail	7,325,571	7,236,935	2,804,711	2,777,884	1,275,216	1,294,026	3,245 644	3,165,025
Express	3,901,104	3,617 354	1,612,978	1,388,853	976,617	871,287	1,311,509	1,357,214
All other transportation	6,768,711	6,525,542	3,400,325	3,324,219	710,473	674,359	2,657,913	2,526,964
Incidental	6,072,807	5,405,037	3,153,805	2,961 988	1,034,641	910,959	1,884,361	1,532,090
Joint facility—Cr.	857,682	854,965	282,893	266,731	182,316	165,852	392,473	422,382
Joint facility—Dr.	182,103	231,692	57,670	51,159	19,317	19,705	105,116	160,828
Railway operating revenues	321,926,714	300,430,323	144,580 556	140,247,898	63,495,043	60 231,989	113,851,115	99,950,436
Expenses:								
Maintenance of way and structures	34,249,159	32,408,176	14,385,865	13,263,366	7,151,773	6,402,165	12,711,521	12,742,645
Maintenance of equipment	64,954,643	62,344,741	29,829,773	29.006 982	11,394,066	11,351,497	23,730,804	21,986,262
Traffic	8,408,717	7,851,043	3,114,152	2,912,631	1,667,817	1,607 781	3,626,748	3,330,631
Transportation	120,462,263	117,837,396	54,101 911	55,403,998	20,369,610	19,588,697	45,990,742	42,844,701
Miscellaneous operations	3,208,188	2,810,134	1,413,736	1,348,232	528,945	421,924	1,265,507	1,039,978
General	13,097,420	12,810,408	5,748,196	5,652 391	2,244,529	2,199,013	5 104,695	4,959,004
Transportation for investment—Cr.	233,919	186,479	63,251	40,014	40,296	12,218	130,372	134,247
Railway operating expenses	244,146,471	235,875,419	108,530,382	107,547,586	43,316,444	41,558,859	92,299,645	86,768,974
Net revenue from railway operations	77,780 243	64,554,904	36,050,174	32,700,312	20,178,599	18.673,130	21,551 470	13,181,462
Railway tax accruals	28,863,316	21,307,286	12,147,506	8,518,168	6,271,190	4,863,309	10,444,620	7,925,809
Railway operating income	48,916,927	43,247,618	23,902,668	24,182,144	13,907,409	13,809,821	11,106,850	5,255,653
Equipment rents—Dr. balance	7,596,133	6,699 882	3,221,374	3,312,589	665 363	86,715	3,709,396	3,300,578
Joint facility rent—Dr. balance	2,962,156	2,985,396	1,587,237	1,635,450	296,893	323,979	1,078,026	1,025,967
Net railway operating income	[3] 38,358,638	[4] 33,562,340	19,094,057	19,234,105	12,945,153	13,399,127	6,319,428	929,108
Ratio of expenses to revenues (per cent)	75.84	78.51	75.07	76.68	68.22	69.00	81.07	86.81
Depreciation included in operating expenses	16,123 988	16,044,495	7,061,413	6,908,432	3,124,756	3,202,795	5,937,819	5,933,268
Total maintenance before depreciation	83,079,814	78,708,422	37,154,225	35,361,916	15 421,083	14,550,867	30,504,506	28,795,639
Net railway operating income before depreciation	54,482,626	49,606,835	26,155,470	26,142,537	16,069,909	16,601,922	12,257,247	6,862,376

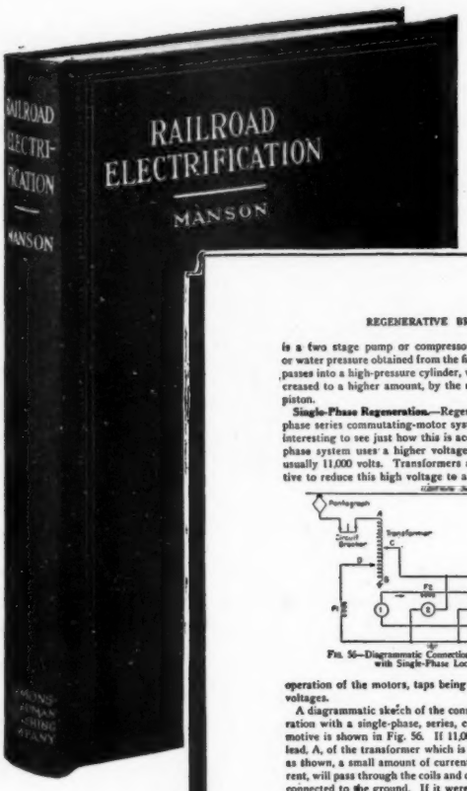
FOR TWO MONTHS ENDED WITH FEBRUARY, 1937 AND 1936

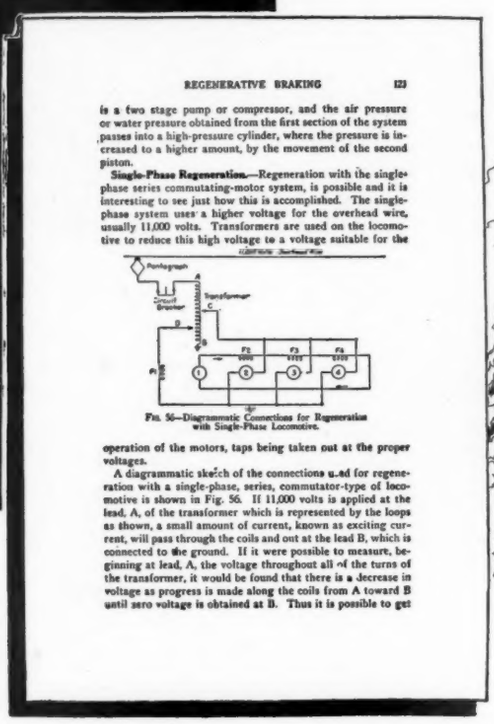
Average number of miles operated	236,031	236,851	58,404	58,638	44,810	44,949	132,817	133,264
Revenues:								
Freight	$532,817,688	$486,244,461	$233,479,603	$217,179,918	$105,007,346	$100,535,012	$194,330 739	$168,529,531
Passenger	[5] 70,456,772	[6] 66,004,287	38,127,967	38,020,409	11,834,281	10,363,457	20,494,524	17,620,421
Mail	15,265,432	14,943,282	5,814,232	5,729,490	2,676,450	2,693,306	6,774,750	6,520,486
Express	7,037 755	6,631,986	2,721,903	2,430,049	1,824,144	1,631,703	2,491,708	2,570,234
All other transportation	13,688,548	13,077,923	6,964,520	6,832,911	1,413,693	1,343,753	5,310,335	4,901,259
Incidental	12,916,243	11,248,242	6,707,577	6,210,915	2,126,774	1,822,702	4,081,892	3,214,625
Joint facility—Cr.	1,801,769	1,799,511	597 348	560,897	364,622	362,405	839,799	876,209
Joint facility—Dr.	372,805	461,041	114,113	100,564	39,718	39,493	218,974	320,984
Railway operating revenues	653,611,402	599,488,651	294,299,037	276,864,025	125,207,592	118,712,845	234,104,773	203,911,781
Expenses:								
Maintenance of way and structures	67,351,322	62,817,284	28,249 076	25,905,460	14,097,302	12,737,074	25,004,944	24,174,750
Maintenance of equipment	132,762,764	124,172,345	61,409,698	57,398,040	23,498,340	22,651,493	47,854,726	44,122,812
Traffic	16 962,902	15,866,602	6,243,272	5,861,551	3,383,126	3,275,796	7,336,504	6,729,255
Transportation	247,732,830	233,418,066	110,925,876	108,988,828	40,937,364	39,185,643	95,869,590	85,243,595
Miscellaneous operations	6,688,605	5,732,180	2,981,209	2,759,547	1,058,561	833,945	2,648,835	2,138,688
General	26,715,217	25,985,887	11,672,913	11,416,027	4,598,314	4,442,888	10,443,990	10,126,972
Transportation for investment—Cr.	403,028	375,859	91,621	67,154	84,113	36,312	227,294	272,393
Railway operating expenses	497,810,612	467,616,505	221,390,423	212,262,299	87,488,894	83,090,527	188,931,295	172,263,679
Net revenue from railway operations	155,800,790	131,872,146	72,908,614	64,601,726	37,718,698	35,622,318	45,173,478	31,648,102
Railway tax accruals	57,336,021	42,871,796	23 866,331	17,307,524	12,657,029	9,616,521	20,812,661	15,947,751
Railway operating income	98,464,769	89,000,350	49,042,283	47,294,202	25,061,669	26,005,797	24,360,817	15,700,351
Equipment rents—Dr. balance	15,461,530	13,636,946	6,704,838	6,813,282	1,121,427	397,335	7,635,265	6,426,329
Joint facility rent—Dr. balance	6,207 921	6,072,532	3,482,198	3,416,545	602,161	635,263	2,123,562	2,020,724
Net railway operating income	[7] 76,795,318	[8] 69,290,872	38,855,247	37,064,375	23,338,081	24,973,199	14,601,990	7,253,298
Ratio of expenses to revenues (per cent)	76.16	78.00	75.23	76.67	69.88	69.99	80.70	84.48
Depreciation included in operating expenses	32,308,855	32,164,119	14,193,280	13,916,482	6,250,066	6,403,529	11,865,509	11,844,108
Total maintenance before depreciation	167,805,231	154,825,510	75 465,494	69,387,018	31,345,576	28,985,038	60,994,161	56,453,454
Net railway operating income before depreciation	109,104,173	101,454,991	53,048,527	50,980,857	29,588,147	31,376,728	26,467,499	19,097,406

[1] Includes $ 837 sleeping and parlor car surcharge.
[2] Includes $803,322 sleeping and parlor car surcharge.
[3] Includes charges to Railway Tax Accruals in the total amount of $7,452,519 itemized as follows: $3,048,791 for taxes under the requirements of the Social Security Act of 1935, and $4,403,728 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress).
[4] Includes charges to Railway Tax Accruals in the total amount of $1,583,873 itemized as follows: $1,432,809 for taxes under the requirements of the Social Security Act of 1935, and $151,064 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress).
[5] Includes $ 6,702 sleeping and parlor car surcharge.
[6] Includes $1,778,243 sleeping and parlor car surcharge.
[7] Includes charges to Railway Tax Accruals in the total amount of $14,915,585 itemized as follows: $6,198,220 for taxes under the requirements of the Social Security Act of 1935, and $8,717,365 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress).
[8] Includes charges to Railway Tax Accruals in the total amount of $2,993,755 itemized as follows: $2,841,897 for taxes under the requirements of the Social Security Act of 1935, and $151,858 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes. (Public No. 400, 74th Congress).

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to Revision.

Railroad Electrification and the Electric Locomotive





REGENERATIVE BRAKING 123

is a two stage pump or compressor, and the air pressure or water pressure obtained from the first section of the system passes into a high-pressure cylinder, where the pressure is increased to a higher amount, by the movement of the second piston.

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FIG. 56—Diagrammatic Connections for Regeneration with Single-Phase Locomotive.

operation of the motors, taps being taken out at the proper voltages.

A diagrammatic sketch of the connections used for regeneration with a single-phase, series, commutator-type of locomotive is shown in Fig. 56. If 11,000 volts is applied at the lead, A, of the transformer which is represented by the loops as thown, a small amount of current, known as exciting current, will pass through the coils and out at the lead B, which is connected to the ground. If it were possible to measure, beginning at lead, A, the voltage throughout all of the turns of the transformer, it would be found that there is a decrease in voltage as progress is made along the coils from A toward B until zero voltage is obtained at B. Thus it is possible to get

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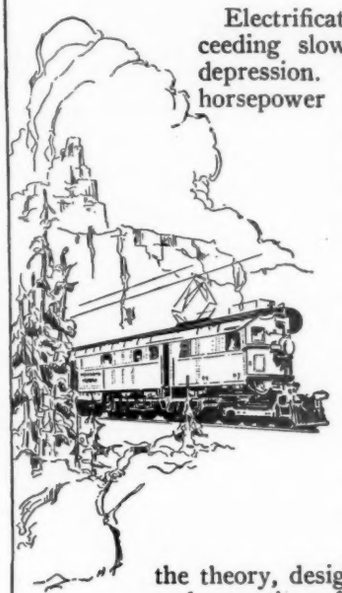

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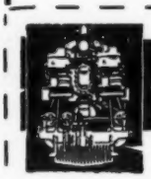

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